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ABSTRACT

The report is designed to provide the reader with a basic understanding of the processes and procedures used to develop catalogs of performance objectives, criterion-referenced measures, and performance guides for learners in vocational-technical education. It reports on the efforts of the Vocational-Technical Education Consortium of States (V-TECS) in promoting the research, development, and implementation of performance-based instruction in vocational-technical education programs. The main body of the report presents information on the organizational structure of V-TECS, its methods and procedures, and the status of catalog development and other projects. A series of appendixes provides more detailed information about the Vocational-Technical Education Consortium of States: bylaws, an activity model and master sequence chart, listing of board of directors, staff resumes, listing of technical coordinators, and an analysis of job titles by project (March 1975). (Author/NJ)

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Second Progress and Information Report
# of the
Vocational-Technical Education Consortium of States

(VT-102-195)

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COMMISSION ON OCCUPATIONAL
EDUCATION INSTITUTIONS
Southern Association of Colleges and Schools
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MAY 1975

2

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PREFACE

The Vocational-Technical Education Consortium of States (V-TECS) is promoting the research, development and implementation of performance-based instruction in vocational-technical education programs. V-TECS has dedicated itself to the systematic and scientific development of performance objectives, performance guides, and criterion-referenced measures for learners. The products developed by V-TECS form the basis for designing student-centered curricula that will enable learners to acquire the skills and knowledges actually required on the job. V-TECS materials are solidly based upon research of current practices in performance-based education and upon a thorough analysis of the current tasks being performed by randomly surveyed job incumbents. The skillful use of writing teams and technically prepared personnel result in catalogs of performance objectives, performance guides, criterion-referenced measures, tool and equipment utilization analysis, and reference lists which serve as resources to derive standards of performance for learners.

This, the Second Progress and Information Report of V-TECS, is designed to provide the reader with a basic understanding of the processes and procedures used to develop catalogs and the nature of the cooperative efforts which bind the members together in the common cause of performance-based education as one alternative to traditional practices.

I. INTRODUCTION

The Vocational-Technical Education Consortium of States (V-TECS) is presently composed of 11 members. These members are the States of Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, South Carolina, Texas, and Virginia. V-TECS has two associate members which are the U.S. Air Force Air Training Command, represented by the Community College of the Air Force, and the U.S. Naval Education and Training Command. Several additional states and agencies are contemplating new membership during the coming fiscal year. Optimum membership will be 14 to 16 states and agencies. V-TECS began as a legally constituted Consortium on July 1, 1973, and has experienced steady growth and development.

The primary purpose of V-TECS is to develop valid catalogs of performance objectives, criterion-referenced measures, and performance guides for learners in vocational-technical education. Methods and procedures used by V-TECS have been carefully planned and tested to provide assurances that the products developed will be of a high quality. Since uniform procedures are used throughout the Consortium, a high degree of confidence has resulted in the materials to be shared by the member states and agencies. This advantage has enhanced the transportability of products with a minimum of adaptation by user states belonging to V-TECS.

V-TECS has several secondary purposes as it develops and operates. These secondary purposes are to: (1) share research and developmental costs; (2) minimize duplication of effort in occupational analysis and curriculum development; (3) share the cost of expensive computer equipment; (4) share the cost of expensive technical personnel; (5) promote the concept of performance-based vocational-technical education with the learner as the focal point; and (6) reduce costs of materials development through improved project management techniques.

There are many peripheral benefits derived by the sharing of experiences while researching performance-based education; developing occupational inventories; conducting occupational interviews; conducting occupational surveys; and utilizing writing teams to derive performance objectives, job-based criterion-referenced measures, and performance guides. The operational nature of V-TECS has resulted in a reduction of individual state autonomy as the need for cooperation has grown in importance.

V-TECS is governed by a policy-making Board of Directors. This Board and its role and scope will be a separate topic of dicussion in later sections of this report. To date, the Board has been a viable force in bringing about high-quality standards for product development and has been instrumental in the effective growth of V-TECS.

This Second Progress and Information Report is designed to present a straight-forward reporting of V-TECS activities since the First Progress Report of March, 1974. It is divided into two sections: (1) the main part or narrative of the report and (2) a comprehensive series of appendices for those readers who want more detail on certain aspects of V-TECS. Written requests for additional information or clarification of aspects of this report may be submitted to V-TECS in care of the address on the cover of this report.

II. ORGANIZATIONAL STRUCTURE

A. Southern Association of Colleges and Schools

The Southern Association of Colleges and Schools is organized exclusively for educational purposes, and its objective is to improve education in the South through exercise of leadership and through the promotion of cooperative efforts among colleges, schools, and related agencies. Member institutions of the Southern Association are grouped into the Commission on Elementary Schools, Commission on Secondary Schools, Commission on Occupational Education Institutions, and Commission on Colleges.

B. Commission on Occupational Education Institutions

The Consortium is a project under the Southern Association of Colleges and Schools (SACS), Commission on Occupational Education Institutions (COEI). COEI has the prime responsibility for the accreditation of post secondary vocational-technical education institutions not covered by other commissions within the SACS structure. COEI provides regional and national leadership in its prime area of responsibility and promotes the improvement of vocational-technical and career education through various research and evaluation activities. COEI has a continuing interest in the improvement of vocational-technical education in the South and the nation.

Figure 1 illustrates the organizational structure and operational relationship of SACS/COEI/V-TECS. SACS/COEI provides a well-established and effective organizational base for V-TECS operations. The Association provides central services, technical assistance, and administrative advice to V-TECS as needed and requested by the Board of Directors or its executive officers. Fiscal controls, personnel management, auditing, and other services available to members of SACS are provided to V-TECS on a shared-cost basis.

ORGANIZATIONAL PLAN FOR V-TECS
A CONSORTIUM TO PRODUCE PERFORMANCE OBJECTIVES AND
CRITERION-REFERENCED MEASURES IN OCCUPATIONAL EDUCATION

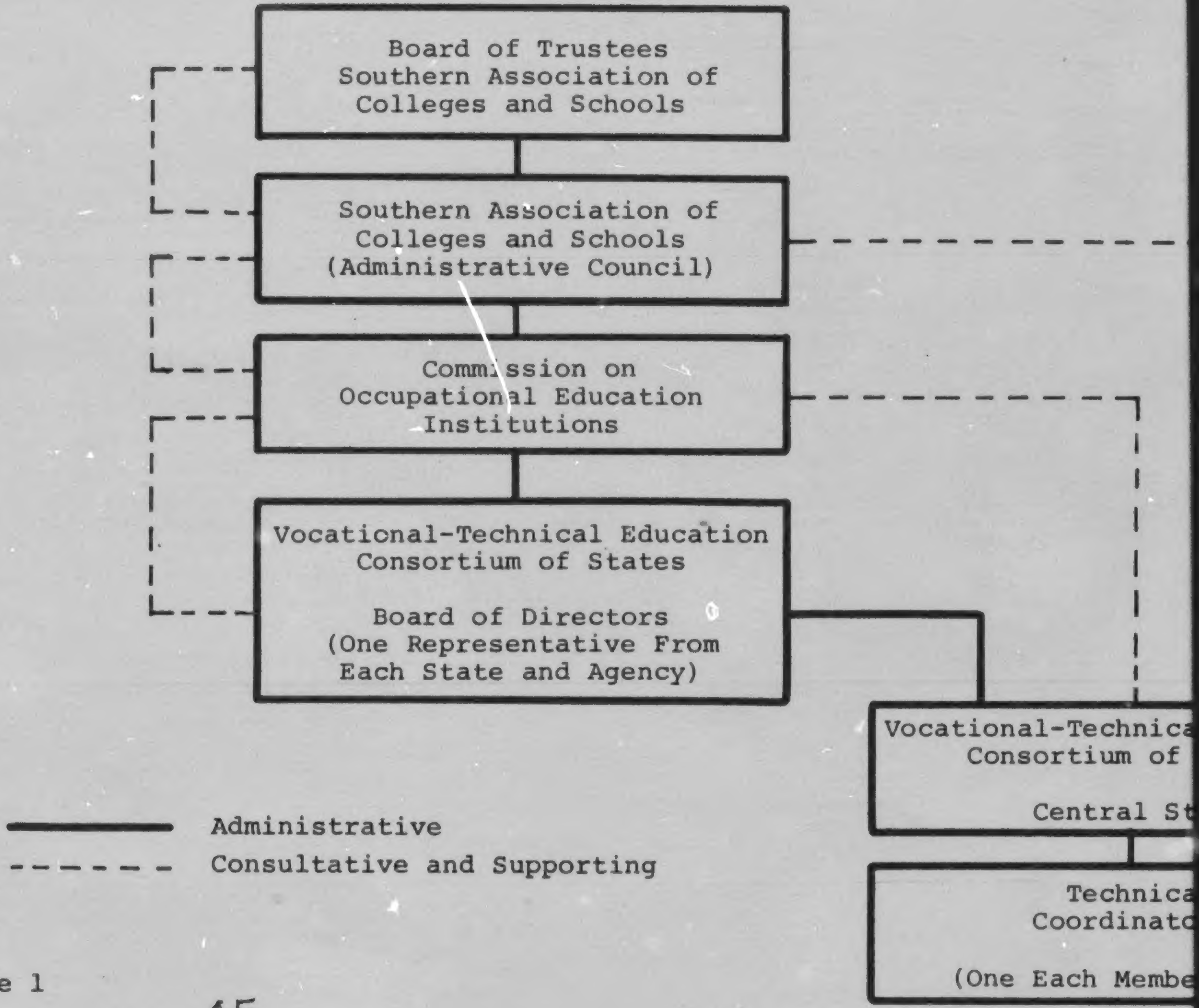
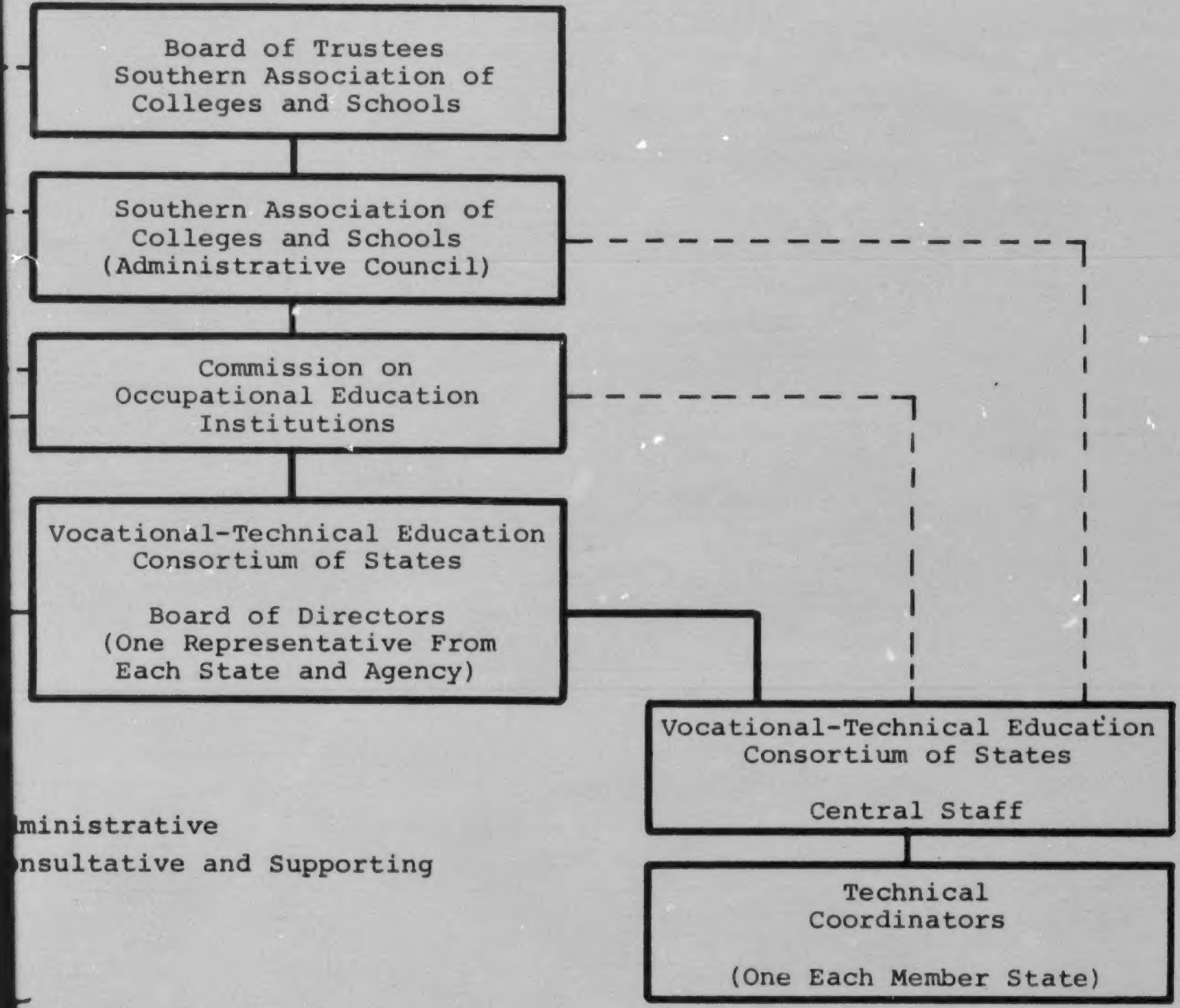


Figure 1

ORGANIZATIONAL PLAN FOR V-TECS
A CONSORTIUM TO PRODUCE PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES IN OCCUPATIONAL EDUCATION


Board of Trustees
Southern Association of Colleges and Schools
Southern Association of Colleges and Schools (Administrative Council)
Commission on Occupational Education Institutions
Vocational-Technical Education Consortium of States
Board of Directors
(One Representative From Each State and Agency)
Vocational-Technical Education Consortium of States
Central Staff
Technical Coordinators
(One Each Member State)

ministrative

nsultative and Supporting

C. Vocational-Technical Education Consortium of States

1. Board of Directors. The Board of Directors consists of one person from each state holding membership status in V-TECS. In addition, an alternate member is named to attend meetings in the absence of the regular member. A member or alternate may cast only one vote for the participating state, although both are present during some meetings. The associate membership status held by the U.S. Air Force Air Training Command and the U.S. Naval Education and Training Command carries no voting privilege. The associate members participate in discussions, serve on committees, and provide advice and technical assistance as needed and requested by V-TECS.

The Board serves as the policy-making body for the Consortium and functions in *ad hoc* committee roles to provide advice, technical assistance, and direction to the V-TECS Central Staff. The Executive Director of V-TECS is the chief administrative officer and provides direction to the V-TECS Staff and other technical personnel in keeping with Board policies and Consortium Bylaws.

Appendix "A", (green section) of this report contains the Bylaws for V-TECS. Detailed minutes have been kept for the nine meetings of the V-TECS Board of Directors. These minutes are the official source of policies, procedures, and practices adopted and used in the operation of V-TECS.

The members of the V-TECS Board are appointed by the person designated in each state's *Plan for Vocational Edu-*

cation as the State Director of Vocational Education. Appointments are for periods of time governed by the State Director of Vocational Education. Such reappointments and/or appointments of a new representative are the option of the participating state.

A comprehensive policy manual will be developed and distributed during the first quarter of the Fiscal Year 1975-76. This guide will serve to further refine and illustrate specific policies, procedures, quality assurances and directions for V-TECS in the coming years. In addition to this document, the Board of Directors is developing in conjunction with the V-TECS Staff, a long-range plan for refining the development, growth, and scope of V-TECS for a three-year period with provisions for annual updating. Activities in the plan will be managed by the application of the PERT System. The long-range plan is expected to be completed by late summer of 1975.

Members of the Board of Directors of V-TECS are as follows:

State	Member	Alternate
Alabama	Miss Ruth Stovall	Mr. James Kendrick
Florida	Dr. Roy Giehls	Dr. Kenneth M. Eaddy
Georgia	Mr. Paul Scott	Dr. Gene Bottoms
Kentucky	Mr. Robert Spillman	Dr. Charles Wade
Louisiana	Mr. Kirby Awagain	Dr. Harry Boyer
Mississippi	Dr. James Wall	Dr. Kent Brooks
South Carolina	Mrs. Emily Owens	Mr. E. H. Jones

State	Member	Alternate
Texas	Mr. W. H. Fitz	Mr. Joe Tokash
Virginia	Mr. L. M. Jewell	Dr. Dale Oliver
SACS	Dr. Bob E. Childers (Ex Officio)	
	Associate Members	
U.S. Air Force	Dr. Worth Scanland	Mr. John Pinning
U.S. Navy	Lt. Col. Wade R. Kilbride	Lt. Col. Richard N. Culbertson

A listing of the addresses and telephone numbers of the regular and alternate Board Members is provided in Appendix "B" (blue section) of this report.

2. Central Staff. The V-TECS Central Staff consists of the Executive Director of V-TECS, two Technical Specialists, a Systems Analyst, and a Research Specialist. These staff members have substantive experience and expertise in vocational-technical education, occupational analysis, and curriculum design and implementation. Technical expertise in the areas of research design, sampling techniques, data analysis, and computer program development is also represented. Staff Resumes are included in Appendix "C" (pink section) of this report.

The primary function of the V-TECS Central Staff is to provide technical assistance and guidance to the member states in order to help assure that high-quality products are produced. To achieve the best match between staff expertise and the types of assistance required, each staff member is assigned primary or secondary responsibility for providing those services that are most compatible with his or her unique area(s) of specialization. Specifically, staff members work with the state Technical Coordinators to provide the following services to member states in accordance with the Memorandum of Agreement:

a. Technical assistance in planning V-TECS related research activities.

b. Technical assistance in the design and implementation of occupational surveys.

c. Technical assistance in the development of catalogs of performance objectives, criterion-referenced measures, and performance guides.

d. Conduct individual training and in-service training workshops for the state Technical Coordinators in directing, managing, and monitoring V-TECS projects.

e. Develop and implement a system for computer storage and retrieval of the occupational survey data and catalog data.

f. Analysis of data and dissemination of special statistical computer reports.

g. Coordinate the design and implementation of dissemination and diffusion activities.

In addition, the following support activities are functions performed by the V-TECS Central Staff:

a. Conduct research in the areas of performance objectives, criterion-referenced measures, and educational consortia.

b. Develop coalitions with business, industry, and other public and/or private agencies or foundations to support efforts of V-TECS.

3. Technical Coordinators in the Member States. The Technical Coordinator in each state belonging to the Consortium has two primary functions which are: (1) to act as liaison between the state projects and the Consortium Staff and (2) to serve as a technical resource person for project personnel within the state. The Technical Coordinator has a key role in the success of projects in a particular state. The preparation and training of this person is vital to the proper functioning of the Consortium and, in particular, the activities within the state. Administratively, the Technical Coordinators are responsible to an administrator in the state but are expected to be responsive to the Consortium Staff.

One of the most important tasks of the Technical Coordinators is that of preparing personnel within their respective states, so that catalog quality is high and content comprehensive. In order to do this, the Technical Coordinator conducts training sessions for the project directors and writing teams, echoing guidance received during professional development workshops conducted by the V-TECS Staff. When local workshops are impractical because of geography, etc., every effort is made to include these personnel in V-TECS conducted training sessions. If neither approach is practical, "one-on-one" training is effected which provides for the Technical Coordinator to meet with individual project directors/writing team members as schedules permit.

a. Duties and Responsibilities Within the State. Within the state, the Technical Coordinator provides the services and performs the following functions:

(1) Monitors projects in developing catalogs of performance objectives and criterion-referenced measures in accordance with the Memorandum of Agreement.

(2) Serves as a resource person for project personnel within the state during Domain Study activities.

(3) Reviews all reports and products developed within the state to

assure that quality criteria have been met.

(4) Supervises the survey of incumbent workers (follow-up activities only) inside the state to assist in obtaining adequate responses to the occupational inventory.

(5) Serves as a resource person for the interpretation of task analysis data to personnel within the state.

(6) Assists in the preparation and training of personnel serving on writing teams to convert task analysis data and task statements to performance objectives.

(7) Provides technical assistance to project directors, so that products are delivered on time and meet acceptable quality standards.

(8) Provides technical advice and assistance to personnel in the state during the field test, field utilization studies and implementation phases of the catalogs.

(9) Assists in the development of the state's dissemination plan and

in-service training plan for implementing the use of the catalogs of performance objectives and criterion-referenced measures.

b. Responsiveness to the Consortium Staff. The Consortium Staff has Technical Specialists whose primary responsibility is to work with and to assist the Technical Coordinators in the member states. The working relationships of these people must be rather close, so that an acceptable quality level of products, training of personnel, and procedures used to develop catalogs can be maintained. In view of these key items, the Technical Coordinators in each state are expected to be responsive to the Consortium Staff as follows:

(1) Participate in all training programs, seminars, and conferences developed and conducted by the Consortium.

(2) Attend other specialized training sessions, courses, conferences, and seminars prescribed by the Board of Directors of V-TECS.

(3) Serve as a technical resource person to projects within the state and make necessary reports required under provisions of the Memorandum of Agreement.

(4) Review all reports and products produced in the state through its project efforts prior to submitting to the V-TECS Staff.

(5) Provide periodic progress reports of projects to the V-TECS Staff at intervals set by the Board of Directors of V-TECS.

A listing of the names, titles, and mailing addresses of the Technical Coordinators is included as Appendix "D" (white section) of this report.

4. Standing Committees. V-TECS has four standing committees which study and recommend policy changes and plans for various aspects of the Consortium operation. The four standing committees are the Bylaw and Policy Committee, the Copyright Committee, the Dissemination, In-service, and Diffusion Committee, and the Format Committee. Each committee is appointed by the Chairman of the Board of Directors and serves until replaced by Board action. The committee serves the following described functions:

a. Bylaw and Policy Committee. The prime purpose of this committee is to interpret new policies passed and adopted by the V-TECS Board of Directors. These policy interpretations are reviewed in terms of their effect on the V-TECS Bylaws with appropriate changes identified and recommended to the Board of Directors. The Bylaws of V-TECS are included as Appendix "A" (green section) of this report.

b. Copyright Committee. The primary purpose of this committee is to develop recommendations governing the copyrighting of the products developed by V-TECS including the staff and member states. Copyright rules, regulations and laws affecting the products are reviewed in terms of proper application to the products developed. The committee develops recommendations and submits these to the Board of Directors for official action.

c. Dissemination, In-service, and Diffusion Committee. A part of the member states commitment to V-TECS is an agreement to develop individual plans for dissemination, in-service training, and diffusion of the products and services developed by the Consortium. The purpose of this committee is to study current practices of dissemination, in-service, and diffusion activities and to incorporate this information into a flexible guide for use by member state personnel as they develop their individual plans. The guide is under development and is expected to be completed by August 31, 1975. The guide will not be rigid but will serve to insure the consideration of major points as plans are conceived and operationalized in the V-TECS member states.

d. Format Committee. The Chairman of the Board of Directors authorized the Executive Director of V-TECS to appoint a committee of four from the ranks of the Technical Coordinators in the participating states to serve on a committee which would review the format of the products and materials produced. This committee has the prime responsibility for determining the content and form of the field review catalogs. It is expected that the committee will be primarily responsible for the format of other products as the processes and procedures of V-TECS become tested and operationalized.

In addition to the four standing committees, the Board has appointed two ad hoc committees to assist in the solution of specialized problems. These committees function in the following special areas:

a. "Beyond the Catalog Committee." This ad hoc committee is studying the implications of the need of curriculum development activities to supplement the catalogs of performance objectives, criterion-referenced measures, and performance guides. The primary focus of the committee has been upon the identification of ways and means for developing learning activities associated with the catalogs and the development of reference materials and other media to be used by both students and teachers. These concerns are closely related to the problems being studied by the Dissemination, In-service, and Diffusion Committee and could lead to a consolidation of these committees.

b, Planning Committee for V-TECS-U.S.O.E. Project. A grant award was made to the Southern Association of Colleges and Schools for V-TECS. The grant was provided for the improvement and expansion of V-TECS computer capability and for a study of the applicability of performance-based instruction to certain target groups of handicapped learners.

The Board of Directors of V-TECS appointed an ad hoc committee to assist the staff in developing plans, delineating responsibility, and advising the project personnel through the life of the project. The committee has met twice and provided helpful input to the conduct of the project. At least one additional meeting of the committee will occur to aid in content identification for the final report of the project.

The persons who make up the membership of the standing and ad hoc committees are identified in Appendix "E" (yellow section) of this report.

III. METHODS AND PROCEDURES

V-TECS develops the projects through a consistently applied procedure in each member state. The products to be delivered and which lead to the final catalogs are carefully reviewed and developed in terms of methodology and format. This uniform procedure will improve the confidence level and transportability of V-TECS products within and between the participating states. The two topics under this section of the report provide information regarding the efforts of V-TECS to insure a high degree of confidence in products being developed and in transportability of the products.

A. The V-TECS Model

A comprehensive model was developed by V-TECS for use by all states. The model consists of 12 major activities and 47 sub-activities. Some activities include project identification; project planning; training of technical personnel; state-of-the-art research; developing survey instruments; surveying job incumbents; preparing field review catalogs of performance objectives, criterion-referenced measures and performance guides; developing in-service, dissemination and diffusion plans; revising and updating information; and third-party evaluation for self-renewal.

The V-TECS model was developed and based upon a thorough study of the experiences of the states of Alabama, Florida, Michigan, Utah, Massachusetts (Project CAREER), and upon other agency activity including the U.S. Air Force Air Training Command and the Educational Testing Service of Princeton, New Jersey. An a priori model was derived from the study and submitted to a nationally selected jury of experts using the Delphi Technique. The jury of experts added sub-activities, deleted sub-activities, and provided input which led to the sequencing of the sub-activities of the V-TECS Model. The jury provided information concerning the relative importance of each sub-activity under realistic and idealistic constraints. The study has been published by the Southern Association of Colleges and Schools, Commission on Occupational Education Institutions. A brief narrative description of the V-TECS Model and a Master Sequence Chart is provided as Appendix "F" (buff section) of this report.

B. Project Survey Results

Preliminary V-TECS occupational inventories and tool and equipment lists are developed from a thorough review of existing literature. These preliminary lists are refined and validated by extensive interviewing of incumbent workers and supervisors in the occupational area to be surveyed. The interviewing process ends only when workers and supervisors cannot add to the duties, tasks, tools, or equipment in the occupational inventory. Accurate inventories are a critical part of the occupational survey process and result in consistent data with higher reliability. The occupational inventories are then distributed in a tightly controlled sample design to randomly selected incumbent workers. The responses are processed by electronic data processing equipment. Information is collected on task time spent, task difficulty, job descriptions, equipment utilization, and cumulative task time spent by specific job title. Concurrently, results are analyzed statistically for reliability, variance, and deviation. Table 1 includes information concerning V-TECS survey data for the first 17 projects in terms of the state developing the project, project title, project number, sample size, overall response rate, usable response rate, and survey instrument reliability.

Table 1

Vocational-Technical Education Consortium of States
Statistical Survey Data

State	Project Title	Project Number	Sample Size	Response Rate	Usable Rate
Florida	Sod Production	1220	188	98.9	98.4
	Auto Body Repair	1221	196	87.8	87.8
	Turf Management	1222	237	99.2	98.7
	Auto Mechanics	1223	208	99.5	99.0
Georgia	Data Processing	1331	190	90.5	90.0
	Machinist	1332	190	72.0	68.9
Kentucky	Dental Assistant	1441	166	67.4	66.3
	Tractor Mechanic	1442	235	71.4	70.2
	Cashier/Checker	1443	208	73.4	72.6
	Carpentry	1444	226	84.4	83.2
	Bank Teller	1445	329	83.2	82.7
	Child Care	1446	166	86.3	85.5

Table 1

Vocational-Technical Education Consortium of States Statistical Survey Data

Project Title	Project Number	Sample Size	Response Rate	Usable Rate	Reliability Coefficient
d Production	1220	188	98.9	98.4	.776
to Body Repair	1221	196	87.8	87.8	.873
rf Management	1222	237	99.2	98.7	.923
to Mechanics	1223	208	99.5	99.0	.943
ta Processing	1331	190	90.5	90.0	.953
chinist	1332	190	72.0	68.9	.945
ntal Assistant	1441	166	67.4	66.3	.942
actor Mechanic	1442	235	71.4	70.2	.924
shier/Checker	1443	208	73.4	72.6	.822
rpentry	1444	226	84.4	83.2	.969
nk Teller	1445	329	83.2	82.7	.850
ild Care	1446	166	86.3	85.5	.912

Table 1 (continued)

State	Project Title	Project Number	Sample Size	Response Rate	Usable Rate
Mississippi	Plumbing	1551	180	86.1	85.5
	Landscaping	1552	167	94.6	94.6
Texas	Water Operator	1661	162	97.2	95.1
Virginia	Secretary	1771	576	87.8	87.8
	Food Service	1772	346	89.6	89.0

Total Sample Size: 3,970
Total Usable Returns: 3,407

Usable Return Rate: 85.82%

Table 1 (continued)

Project Title	Project Number	Sample Size	Response Rate	Usable Rate	Reliability Coefficient
umbing	1551	180	86.1	85.5	.948
ndscaping	1552	167	94.6	94.6	.936
ter Operator	1661	162	97.2	95.1	.913
cretary	1771	576	87.8	87.8	.848
od Service	1772	346	89.6	89.0	.891

le Size: 3,970
le Returns: 3,407

urn Rate: 85.82%

IV. CATALOG DEVELOPMENT AND PROJECT STATUS

V-TECS has 50 projects under development in the nine member states. Twenty-seven of the projects under development will be completed during the 1975 calendar year. Twenty-five new catalog projects will begin during the fiscal year 1975-76 and should be near completion during the calendar year 1976. Projects presently under development by V-TECS are based upon occupational analyses of more than 200 occupations.

A. Projects to be Completed During the Calendar Year 1975

The initial 19 projects which will be completed during the calendar year 1975 and eight of the second set of projects have provided the means of implementing the V-TECS Model. Project experiences are being recorded and will provide the basis for a comprehensive PERT (Program Evaluation and Review Technique) system to be operationalized on the third set of V-TECS catalogs. This information concerning time and cost data will be used to provide suggestions to the V-TECS member states for improved project management and cost reduction. The initial program which will be computer-based has been developed and is currently being refined using simulated data. A further explanation of the PERT system for project management is presented in Part V of this report.

Table 2 provides information concerning the catalogs which are expected to be completed during the calendar year 1975. In addition, the Table identifies the catalog occupational area, the state developing the catalogs, the expected completion date of the field review version of the catalogs, and the final version of the catalogs.

Table 2
Vocational-Technical Education Consortium of States
Catalogs To Be Completed In 1975

State	Catalog Title	Field Review Version	F
Alabama	Air Conditioning/Refrigeration	6/20/75	
	Radio & Television Repair	6/30/75	
	Cosmetology	8/1/75	
	Alterationist	9/1/75	
	Licensed Practical Nurse	9/1/75	
	Nurseryman	10/1/75	
Florida	Auto Body Repairman	A*	
	Turf Management	5/15/75	
	Auto Mechanic	5/20/75	
Georgia	Data Processing	A	
	Machinist	A	
	Emergency Medical Technician	10/5/75	

Table 2
Vocational-Technical Education Consortium of States
Catalogs To Be Completed In 1975

Catalog Title	Field Review Version	Finished Catalog
r Conditioning/Refrigeration	6/20/75	9/20/75
dio & Television Repair	6/30/75	9/20/75
smetology	8/1/75	12/30/75
terationist	9/1/75	12/30/75
censed Practical Nurse	9/1/75	12/30/75
rseryman	10/1/75	12/30/75
to Body Repairman	A*	7/1/75
rf Management	5/15/75	7/1/75
to Mechanic	5/20/75	7/1/75
ta Processing	A	6/30/75
chinist	A	6/30/75
ergency Medical Technician	10/5/75	12/5/75

Table 2 (continued)

State	Catalog Title	Field Review Version
Kentucky	Dental Assistant	A
	Tractor Mechanic	A
	Cashier-Checker	A
	Bank Teller	A
	Child Care	A
	Carpenter	5/15/75
	Medical Assistant	10/1/75
	Secretarial	10/1/75
Mississippi	Plumbing	A
	Landscaping	A
Texas	Water Operator	A
	Patrolman	A

Table 2 (continued)

Catalog Title	Field Review Version	Finished Catalog
ntal Assistant	A	7/1/75
actor Mechanic	A	7/1/75
shier-Checker	A	7/1/75
nk Teller	A	7/1/75
ild Care	A	7/1/75
rpenter	5/15/75	9/15/75
dical Assistant	10/1/75	12/1/75
cretarial	10/1/75	12/1/75
mbing	A	7/1/75
dscaping	A	7/15/75
ter Operator	A	7/18/75
rolman	A	7/18/75

Table 2 (continued)

Catalog	Catalog Title	Field Review Version
Virginia	Secretary	A
	Food Service	A
	Nursing Assistant	8/30/75

* Available

Table 2 (continued)

Catalog Title	Field Review Version	Finished Catalog
cretary	A	6/30/75
od Service	A	6/30/75
rsing Assistant	8/30/75	12/30/75

e

B. Projects Currently Under Development

Table 3 includes information concerning projects which are considered under development and which are not expected to be available during the 1975 calendar year. Table 3 provides information regarding the states developing the catalogs, occupational areas of the catalogs, expected completion dates for the field review version, and final version of the catalogs. More detailed information concerning the actual job titles is included in each catalog by state as Appendix "C" (pink section) of this report. This information is based upon the timely delivery of products in keeping with the Memorandum of Agreement signed by the V-TECS member states.

Table 3

Vocational-Technical Education Consortium of States Catalogs Currently Under Development

State	Project Title	Field Review Version	F
Alabama	Masonry	7/7/75	
	Bookkeeper	7/11/75	
	Nursing	7/30/75	
	Auto Parts Clerk	9/14/75	
Florida	Floriculture	7/15/75	
	Welding	7/15/75	
	Tax Collector	8/2/75	
	Hospital Ward Clerk	9/3/75	
	Housing Management	11/20/76	
Kentucky	Electricity	7/2/75	
	Agriculture Power & Machinery	7/2/75	
	Home Furnishing	7/2/75	
	Florist & Floral Sales	12/10/75	

Table 3

Vocational-Technical Education Consortium of States
Catalogs Currently Under Development

Project Title	Field Review Version	Finished Catalog
Masonry	7/7/75	1/7/76
Bookkeeper	7/11/75	1/11/76
Nursing	7/30/75	1/30/76
Auto Parts Clerk	9/14/75	3/14/76
Floriculture	7/15/75	1/15/76
Welding	7/15/75	1/15/76
Tax Collector	8/2/75	2/2/76
Hospital Ward Clerk	9/3/75	3/3/76
Housing Management	11/20/76	5/20/76
Electricity	7/2/75	1/2/76
Agriculture Power & Machinery	7/2/75	1/2/76
Home Furnishing	7/2/75	1/2/76
Florist & Floral Sales	12/10/75	6/10/76

Table 3 (continued)

State	Project Title	Field Review Version
Louisiana	Ship & Boat Operation	8/7/75
	Hotel/Motel Management	9/28/76
Mississippi	Cotton Gin Operator	7/17/75
	Industrial Sewing	7/17/75
South Carolina	Small Engine Repair	8/6/75
	Textile Production	8/6/75
Texas	Offset Printing	7/23/75
	Diesel Mechanic	9/21/75
	Drafting	9/21/75
Virginia	Logging	11/19/75

Table 3 (continued)

Project Title	Field Review Version	Finished Catalog
Ship & Boat Operation	8/7/75	2/7/76
Hotel/Motel Management	9/28/76	3/28/76
Cotton Gin Operator	7/17/75	1/17/76
Industrial Sewing	7/17/75	1/17/76
Small Engine Repair	8/6/75	2/6/76
Textile Production	8/6/75	2/6/76
Offset Printing	7/23/75	1/23/76
Diesel Mechanic	9/21/75	3/21/76
Drafting	9/21/75	3/21/76
Logging	11/19/75	3/19/76

C. V-TECS Occupational Information and Catalog Data Banks

Two data banks are being developed and maintained by V-TECS which provide rapid access by the use of a computer and/or computer terminal. The occupational information data bank and the catalog data bank are linked by a common file system using the computer, so that an infinite number of catalogs may be compiled with associated occupational data to meet the specific needs of a national, regional, state or local request. The two data banks may be accessed independently or in association. This capability provides V-TECS member states the potential of requesting catalogs as simple as they desire or as complex as necessary. It is believed that the complex catalogs with associated occupational survey data will be used by curriculum researchers, curriculum developers, and curriculum specialists to make the basic decisions regarding open entry/exit points, articulation of programs, and entry level job requirements in terms of the job and task specific performance objectives.

1. Occupational Data Bank. The occupational data bank consists of information collected from job incumbents by use of the survey instruments developed in each project. The information is collected by means of a comprehensive sampling of job incumbents using a computer generated list of random numbers. The data is coded and stored in the data bank by United States Office of Education (U.S.O.E.) and Dictionary of Occupational Titles (D.O.T.) classification. The V-TECS

occupational data bank contains information concerning tasks performed by job incumbents, percentage of the members performing the tasks, relative time spent performing the tasks, job descriptions, relative task difficulty, difference between tasks performed by D.O.T., background demographic data, tools and equipment used by job incumbents, including the percentage and number utilizing tools and equipment by D.O.T. job title. V-TECS is currently developing a relative weighting of tasks in terms of the time spent and difficulty. These relative weightings will be expressed in stanine values from that task requiring the most time to that requiring the least time. This same range in terms of stanine values will be used for weighting tasks in terms of difficulty.

New information and potential usage of occupational data are being studied on a continuous basis. This type of detail is designed primarily for those persons who conduct curriculum research and curriculum development activities.

2. V-TECS Catalog Data Bank. The catalogs of performance objectives, criterion-referenced measures, and performance guides will be computerized by U.S.O.E. cluster and D.O.T. classification. A simulated catalog has been computerized and is in the process of computer program revision and debugging. The catalog data bank will become operational by late fall of 1975. V-TECS will use the catalog data bank and occupational data bank in conjunction. The buffer file will provide the necessary interface for meeting individual needs and require-

ments. Catalogs may be retrieved for the special requirements of various user groups in vocational education; i.e., curriculum researchers, program planners, curriculum developers, curriculum specialists, program supervisors and teachers.

D. Status of Project Grant Number O.E.G.-0-74-8581 by V-TECS for U.S.O.E.--(Vocational Education Research)

In January, 1974, V-TECS submitted a proposal to the United States Office of Education (U.S.O.E.) for FY74 funding under Section 131(a) of Part C of the Vocational Education Act of 1963 as amended in 1968. The proposed project, entitled "A Project to Computerize Performance Objectives and Criterion-Referenced Measures in Occupational Education for Research and Determination of Applicability to Handicapped Learners," was funded and is now being implemented. The duration of the project is July 1, 1974, through December, 1975.

This project was designed to (1) develop and refine the computer capabilities of V-TECS which would permit documentation of new programs and systems, development of new programs and systems, and development of a computer bank of performance objectives, criterion-referenced measures, and performance guides; (2) test the feasibility of adapting the catalogs for use in occupational training programs for handicapped persons; and (3) to enhance the possibility of more widespread utilization of the catalogs.

The plan of action for conducting this project consists of three major areas of activity. First, work is underway to develop and operationalize a computerized system for storing and retrieving performance objectives, criterion-referenced measures, and performance guides when appropriate. This system will permit rapid access to the data when the need arises to revise and update the catalog content. The coding system will be designed to allow retrieval of performance objectives, criterion-referenced measures, and performance guides by the U.S.O.E. Code, D.O.T., commonality across job clusters, and other needs of requesting agencies.

Second, plans are underway to organize special committees within each of the original seven V-TECS member states to review selected catalogs. The purpose of the review is to determine the extent to which the stated performances and standards are attainable by selected groups of handicapped persons. A coding system will be developed and implemented to permit identification of the performance objectives judged to be appropriate for various groups of handicapped learners.

Third, to enhance the possibility of more widespread utilization of the catalogs, a conference for curriculum developers in the V-TECS states will be conducted. This conference will be designed to acquaint this audience with the scope, use, and implications of the catalogs of performance objectives and criterion-referenced measures. It will serve also as a vehicle for disseminating V-TECS products.

Specifically, the following tasks represent the progress made by the project staff in implementing the project:

1. Prepared and distributed a Keypunch Format Guide for Occupational Inventory Booklets.
2. Prepared and distributed a Keypunch Guide for the Field Review Catalog.
3. Prepared and distributed a Keypunch Guide for Performance Objectives, Criterion-Referenced Measures, and Performance Guides.
4. Designed a computer system that will permit retrieval of performance objectives, criterion-referenced measures, and performance guides based upon D.O.T. and other background variables. This system is currently being refined and debugged using simulated data.
5. Developed and refined the documentation of all computer programs utilized by V-TECS.
6. Developed a cross-reference table between

duty/tasks and performance objectives, so as to further enhance product utilization.

7. Initiated plans for the establishment of a remote job-entry capability between V-TECS Central Office and the computer at the Nashville State Technical Institute. The terminal is installed and in use by the V-TECS Central Office.
8. Prepared a draft of the state-of-the-art report of performance-based instruction for the handicapped. This report will be updated and finalized for inclusion in the end-of-the-year report on the project.
9. Established contacts within the Federal Regional Office of Rehabilitation and obtained its assistance in securing names of qualified rehabilitation representatives in each of the original seven V-TECS member states to work with the review committees.
10. Met with the Technical Coordinators to explain the purposes of the project, their role in the conduct of the project, and the progress made.
11. Met with and obtained input from the *Ad Hoc* Planning Committee for the project to finalize guidelines for (1) the specific project

activities including sequencing and assignment of responsibilities to V-TECS and to the member states and (2) the backgrounds and specialties to be represented on the special committees.

12. Worked with the Regional Program Officer from U.S.O.E. to obtain and compile U.S.O.E. data by state on handicapped enrollments and completions in vocational education programs for each of the V-TECS states in the Southeast Region.

13. Visited the West Virginia Research and Training Center to review their national data bank and made arrangements to secure computer print-out data by state on the types of handicapped persons served by Vocational Rehabilitation and the types of jobs in which they are placed. This data, in conjunction with the data collected in Step 12 above and other state data, if available, will form the basis for making decisions about the occupational areas and the handicapped groups to be included in this feasibility study.

E. Proposal Pending by V-TECS to U.S.O.E.--
(Vocational Education Research)

In November, 1974, V-TECS submitted a proposal to the United States Office of Education (U.S.O.E.) for FY75 funding under Section 131(a) of Part C of the Vocational Education Act of 1963 as amended in 1968. The title of the proposed project is "A Project to Improve Articulation, Transportability, and Open Entry/Exit Capabilities of Vocational-Technical Education Programs."

This proposal focuses upon two broad areas of need for research and development in vocational education. First, there is a need to improve the information base available to administrators, curriculum designers, and others who are responsible for making decisions about the focus and structure of vocational education programs. Second, there is a need to develop, disseminate, and diffuse products and outputs designed to improve the management of instruction in vocational education. Efforts directed toward alleviation of these needs should ultimately impact upon the relevance and quality of "what" is taught and, thus, upon the ability of training program graduates to perform satisfactorily on the job.

The proposed project will address these areas of need by developing and conducting activities which will permit V-TECS to accomplish the following objectives: (1) extend the current computer storage and retrieval capability of V-TECS to include an identification and compilation of those tasks and content which are common across selected occupations; (2) refine and implement a system to identify and code those performance objectives which are attainable by selected groups of handicapped learners; (3) develop probability estimates for the performance of clusters of tasks across program levels for vocational education learners including the handicapped; (4) devise and test a management strategy for the utilization of V-TECS materials which has implications for the management of other performance-based materials; and (5) formulate a model for dissemination and diffusion of V-TECS materials which has implications for the dissemination and diffusion of other performance-based materials.

The outputs and products generated will contribute to and improve upon the information base currently available for use in planning and managing vocational education programs. The developmental approach will contribute to a high degree of product transportability particularly in the V-TECS member states. The proposed project activities will result in the development of a system that has potential for providing increased articulation between and within program levels, decisions for open entry/exit capabilities, and techniques for disseminating and diffusing performance-based materials.

V. PROGRAM EVALUATION AND REVIEW TECHNIQUE (PERT) APPLICATION TO V-TECS CATALOG DEVELOPMENT AND LONG-RANGE PLANNING

A. Development of V-TECS Long-Range Plans

V-TECS has been involved for the past 11 months in the formulation of long-range plans. This planning has been accomplished during regular meetings of the Board of Directors, through studies by the Central Staff, and during a one and one-half day meeting of the Board and staff for this expressed purpose. To date, a number of goals have been developed with some work accomplished on objectives and time frames for attaining the goals.

The Delphi Technique will be used to further develop the goals, refine the objectives, set realistic time parameters, and establish a prioritized ranking. The first application of the Delphi Technique will be made during May, 1975. The panel or jury will consist of all members of the Board of Directors (including alternates) and the V-TECS Central Staff. The study is expected to be completed by the end of the summer of 1975 with a recommended long-range plan to be considered for adoption by the Board of Directors during the fall meeting.

B. PERT Application to V-TECS Activities

1. Catalog Development. A PERT network has been developed to assist in the improvement of product delivery by the member states. The network and supporting product delivery schedules will provide the project personnel with information concerning the time and cost for each V-TECS product leading to and including the final catalogs. Project personnel will be provided information concerning the average time required by all projects to develop a specific product, average costs involved in the development of the product, and standard deviation for these data. Comparison will be possible across all products by state in V-TECS. This type of information processed through the V-TECS PERT network will assist in identifying the probability of delivery of any product for any project under development. These data should aid in an improvement of the development processes used by V-TECS, identification of major cost centers, identification of points of high and low human resource needs, and other similar types of project improvement information. The reporting system used to support the PERT network is computer-based and is designed for maximum flexibility.

2. Long-Range Planning. A PERT network will be developed upon completion of the V-TECS Long-Range Plan. This application of PERT will permit the orderly reporting of progress in

terms of the long-range plan and will provide the basis for periodic progress reports to the Board of Directors. It is anticipated that this network will be completed and implemented by November, 1975.

VI. INFORMATION FOR MEMBERSHIP
IN THE
VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

A. Period of Membership

The V-TECS enrollment period begins on July 1 of each fiscal year and ends on September 30 of the same fiscal year. Interested applicants must file a letter of intent to join or complete the processing of the V-TECS membership form. Membership may not be accepted after the September 30 closing date, except with the approval of the Board of Directors.

B. Process for Membership

A letter requesting membership may be submitted at any time. If the membership is for the ensuing year, a letter should be submitted during the first month of the membership period. Any state requesting membership is entitled to an on-site visit by the Executive Director of V-TECS who will provide in-depth presentations with explanations and examples of the products of the Consortium. The visit is based upon an interest expressed in writing by the person designated in the state's Plan for Vocational Education as the State Director of Vocational Education. After written notification of the intent to join V-TECS, a formal agreement will be negotiated by the Southern Association of Colleges and Schools, Commission on Occupation Education Institutions, Vocational-Technical Education Consortium of States.

Upon completing and processing the agreement forms, the state is requested to name their member and alternate member to the V-TECS Board of Directors. For information concerning membership in V-TECS write:

Dr. Ben A. Hirst, Jr., Executive Director
Vocational-Technical Education
Consortium of States
Southern Association of Colleges and Schools
Commission on Occupational Education
Institutions
795 Peachtree Street, N.E.
Atlanta, Georgia 30308
Telephone: (404) 875-8011

APPENDIX "A"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

BYLAWS

THE VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES
FOR THE DEVELOPMENT OF CATALOGS OF PERFORMANCE
OBJECTIVES AND CRITERION-REFERENCED MEASURES
IN OCCUPATIONAL EDUCATION

BYLAWS

ARTICLE I.

Name.

The name of this organization shall be the VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES (V-TECS).

ARTICLE II.

Purposes and Objectives.

The purpose and objectives of V-TECS shall be to:

a. secure participation of divisions, departments, or bureaus of vocational-technical education in state educational agencies (or their appointed representatives) in cooperative efforts for the purpose of producing and exchanging catalogs of performance objectives and criterion-referenced exercises in occupational education;

b. develop, implement, and evaluate standard performance criteria to be utilized in the in the production of catalogs by each participating state to assure quality control and transportability of materials;

c. develop, implement, and evaluate a system for periodically updating and revising catalogs developed by member states;

d. secure additional technical or financial assistance from business and industry, other interested state or Federal agencies and educational foundations; and

e. promote the concept of performance-based education as a means of improving curricula and providing for increased accountability in occupational education.

ARTICLE III.

Membership.

Section 1. Membership in V-TECS shall consist of active membership and associate membership.

Section 2. "Active Membership". Any state educational agency (or its appointed representative) desirous of participating in the organization (participation being as submission of a letter of intent to, or a contract or grant for the member's proportional share of administrative costs including a commitment to develop or refine agreed upon catalogs) is entitled to become an active member of the organization.

Section 3. "Associate Membership". Any state, Federal or non-profit private agency desirous of participating in the organization (participation being defined as (1) a contract or grant for the member's proportional share of administrative costs, or (2) "in-kind" services consisting of the assignment of personnel, products and systems under development) is entitled to become an associate member of the organization, pending approval by a majority vote of the Board of Directors.

ARTIVLE IV.

Board of Directors.

Section 1. Number of Directors. The business, property and affairs of V-TECS shall be managed by a Board of Directors consisting of one person from each state designated an "active member". Each "associate member" of the organization will be encouraged to appoint one person to serve as a member of the Board of Directors. The Executive Secretary of the Commission on Occupational Education Institutions will also serve as a member (ex officio) of the Board of Directors. Directors representing "active members" will have voting privileges while Directors from "associate members" and the Executive Secretary, Commission on Occupational Institutions, will not have voting privileges.

Section 2. Membership on Board of Directors. Each person serving on the Board of Directors from a state designated as an "active member" shall be the person identified by the State Director of Vocational Education in the State Plan for Vocational Education. The State Director of Vocational Education shall also identify a person to serve as an alternate member of the Board of Directors.

Section 3. Qualifications of Directors. Each person serving on the Board of Directors should have experience in curriculum development, evaluation methodology or related research in Occupational Education.

Section 4. Power to Make Bylaws. The Board of Directors shall have power to make and alter any Bylaw or Bylaws, provided, that the Board shall not make or alter any Bylaw or Bylaws, fixing the qualifications, classification or term of office of any member or members of the then existing Board.

ARTICLE V.

Administering Agency.

Section 1. Administering Agency. An Administering

Agency shall be retained by the Board of Directors of V-TECS provide technical assistance and coordination of activities for the member states. The agency shall have regional or national visibility and the capability of developing broad-based contacts and alliances to the attainment of the organization's objectives.

Section 2. Financial Support of the Administering Agency. Each state participating as an active member of the organization shall assume a proportional share of the operational expenses of the Administering Agency. These expenses, which will be renegotiated annually, shall be payable between July 1 and September 30 of the appropriate fiscal year.

Section 3. Employment of Staff. The Administering Agency with approval of the Board of Directors will employ staff as required to fulfill the Consortium level responsibilities. An Executive Director shall be employed to supervise this staff and to work directly with the Board of Directors in operating the Consortium.

Section 4. Fiscal Accounting by Administering Agency. An annual accounting of all monetary receipts and disbursements shall be made by the Administering Agency. This audit shall be made by a certified public accounting firm selected by the Administering Agency and, upon receipt, shall be submitted to the Board of Directors for review and reaction.

ARTICLE VI.

Officers.

Section 1. Chairman. The Chairman shall be selected by and from the voting membership of the Board of Directors. He shall reside over all meetings of the Board and shall see that all recommendations and resolutions of the Board are carried into effect. In addition, he shall be an ex officio member of all standing committees.

Section 2. Vice Chairman. A Vice Chairman shall be chosen from the voting membership of the Board. The Vice Chairman shall perform the duties and exercise the powers of the Chairman during the absence or disability of the Chairman.

ARTICLE VII.

Meetings of the Board of Directors.

Section 1. Frequency of Meetings. Meetings of the Board of Directors of V-TECS will be held quarterly. More frequent meetings may be called by the Board Chairman or by a majority of the voting members of the Board.

Section 2. Notification of Meetings. All members of the Board of Directors shall be notified in writing at least twenty days prior to the meeting. It shall be the responsibility of the Executive Director of the Administering Agency to inform the Directors of the scheduled meeting.

Section 3. Attendance at Meetings. All members of the Board of Directors shall be expected to attend regular and special meetings. In the event a member of the Board is unable to attend a meeting, a designated alternate from the member state will be permitted to attend and participate in all business. The names of designated alternates will be submitted to the Chairman of the Board and the Executive Director of the Administering Agency at the first regularly scheduled meeting of the Board. Any change in the person identified as designated alternate shall be reported in writing to the Chairman of the Board of Directors and the Executive Director of the Administering Agency.

Section 4. Number of Votes to Which Each Director is Entitled. At all meetings of the Board of Directors, each voting Director shall have one vote.

Section 5. Quorum at Director's Meeting. A majority of voting Board of Directors or designated alternates shall be necessary to constitute a quorum for transaction of business.

Section 6. *Majority Vote*. The act of the majority of Directors present at a meeting at which a quorum is present shall be the act of the Board of Directors.

Section 7. *Meeting Place*. The normal meeting place shall be Atlanta, Georgia.

ARTICLE VIII.

Standing Committees

The Chairman of the Board of Directors shall appoint such standing committees and *ad hoc* committees as he and the Board of Directors deem necessary.

ARTICLE IX.

Fiscal Year.

The fiscal year of the organization shall be from July 1 to the following June 30, unless otherwise provided by the Board of Directors.

ARTICLE X.

Amendments to Bylaws.

Amendment Without Prior Notice. These Bylaws may be amended without prior notice by a vote of two-thirds of the members of the Board of Directors at any regular meeting at which there is a quorum present.

APPENDIX "B"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES
BOARD OF DIRECTORS

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

BOARD OF DIRECTORS

Alabama

Miss Ruth Stovall, Branch Director
Program Services
State Department of Education
State Office Building
Montgomery, Alabama 36104
(205) 832-3285

*Mr. James Kendrick
Curriculum Specialist
State Department of Education
Room 855, State Office Building
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(205) 832-3473

Florida

Dr. Roy Giehls, Consultant
Bureau of Vocational Research
& Evaluation
Room 254, Knott Building
Tallahassee, Florida 32304
(904) 488-8401

*Dr. Kenneth M. Eaddy, Chief
Bureau of Vocational Research
& Evaluation
Division of Vocational Technical
& Adult Education
Florida Department of Education
Tallahassee, Florida 32304
(904) 488-3995

* Alternate

BOARD OF DIRECTORS - (continued)

Georgia

Mr. Paul Scott, Director
Occupational Research
Coordinating Unit
State Department of Education
Room 250, State Office Building
Atlanta, Georgia 30334
(404) 656-2429

*Dr. Gene Bottoms, Director
Division of Programs &
Staff Development
Division of Vocational Education
State Department of Education
Atlanta, Georgia 30334
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Kentucky

Mr. Robert Spillman, Director
Personnel Development Unit
Bureau of Vocational Education
2035 Capital Plaza Tower
Frankfort, Kentucky 40601
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*Dr. Charles D. Wade, Director
Program Development Division
Bureau of Vocational Education
Capital Plaza Tower
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BOARD OF DIRECTORS - (continued)

Louisiana

Mr. Kirby Awagain, Director
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State Department of Education
P. O. Box 44064
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*Dr. Harry Boyer
Bureau of Vocational Education
State Department of Education
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Mississippi

Dr. James Wall, Director
Research & Curriculum Unit
Mississippi State University
Drawer DX
Mississippi State, Mississippi 39762
(601) 325-2510

*Dr. Kent Brooks
Technical Coordinator
Research Coordinating Unit for Vocational-Technical Education
Mississippi State University
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BOARD OF DIRECTORS - (continued)

South Carolina

Mrs. Emily T. Owens
Chief Supervisor
Program Planning
Office of Vocational Education
904 Rutledge Building
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(803) 758-2482

*Mr. E. H. Jones, Coordinator
Area Vocational Centers
Office of Vocational Education
State Department of Education
903 Rutledge Building
Columbia, South Carolina 29201
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Texas

Mr. W. H. Fitz
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APPENDIX "C"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

BRIEF STAFF RESUMES

BOB E. CHILDERS, EXECUTIVE SECRETARY

COMMISSION ON OCCUPATIONAL EDUCATION INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS

EDUCATION: Dr. Childers holds an Ed.D degree in Educational Administration from the University of Tennessee, Knoxville, Tennessee, a M.A. degree in Education Administration from Memphis State University, and a B.A. degree in Education from Union University, Jackson, Mississippi.

TEACHING EXPERIENCE: For three years, Dr. Childers instructed U.S. Navy officer personnel in the advanced systems of avionics, mechanical drafting, English composition, technical report writing, and public speaking. He also taught advanced fire control systems and basic electronics for two years to U.S. Army enlisted personnel.

EMPLOYMENT: Dr. Childers was employed by the U.S. Office of Education as Director of Adult, Vocational, and Library Programs for the six southeastern states in Region IV. He served as Assistant Commissioner of Education for Vocational-Technical Education with the Tennessee State Department of Education and Director of M.D.T.A. Programs in auto mechanics, machine woodworking, and office practices. Dr. Childers also served as Principal of McMinn County High School in Athens, Tennessee, for three years and as Principal of Halls High School in Knoxville, Tennessee, for one year.

Dr. Childers assumed his present position as Executive Secretary, Commission on Occupational Education, with the Southern Association of Colleges and Schools in 1969. He also holds an adjunct professorship in the School of Education, North Carolina State University. Dr. Childers has served as a consultant on many national and regional committees and is the author of several publications.

BENJAMIN A. HIRST, JR., EXECUTIVE DIRECTOR

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Hirst holds an Ed.D. degree in Vocational-Technical Education from the University of Tennessee, Knoxville, Tennessee, and a M.A. degree and B.S. degree from Middle Tennessee State University.

TEACHING EXPERIENCE: Dr. Hirst taught graduate level courses at the University of Tennessee, supplementary courses in blueprint reading and math to tool and die apprentices and was a machine shop teacher for three years with the Decatur County Schools in Parsons, Tennessee. Also, Dr. Hirst has been a visiting lecturer at several universities.

EMPLOYMENT: Dr. Hirst served an internship with the Commission on Occupational Education Institutions, Southern Association of Colleges and Schools. Upon completion of the internship, he became Project Director for the Feasibility Study leading to the Formation of V-TECS. As an EPDA Fellow, he served a Research Internship with the Research Coordinating Unit for Vocational Education, Knoxville, Tennessee. Formerly, Dr. Hirst was employed by the State Department of Education, Nashville, Tennessee, for seven years. During this time, he served as State Coordinator, State Director, and Supervisor of the Area Vocational-Technical Schools. Other employment includes four years as a tool and die maker and four years as a U.S. Navy Machinist.

Dr. Hirst has been with the Southern Association of Colleges and Schools since August, 1972. In June, 1973, he was appointed to his present position as Executive Director for the Vocational-Technical Education Consortium of States.

TONY M. HINSON, SYSTEMS ANALYST

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Hinson holds an Ed.d degree in Vocational-Technical Education from the University of Tennessee, Knoxville, Tennessee, a M.S. degree in Mathematics and a B.S. degree in Electrical Engineering from Tennessee Technological University, Cookeville, Tennessee.

TEACHING EXPERIENCE: In Tennessee, Dr. Hinson served two years as a Mathematics, Electronics, and Computer Science Instructor at Dyersburg State Community College, one year in Mathematics and Electronics at Columbia State Community College, and two years as a graduate student in Mathematics at Tennessee Technological University.

EMPLOYMENT: Dr. Hinson spent four years as a Research Engineer with the National Aeronautics and Space Administration, served as a Research Engineer with the Boeing Company, and as a Consultant Engineer with Associates Engineers, Inc.

Dr. Hinson served internships with the Division of Vocational Education in the Knoxville City School System; with the Research Coordinating Unit for Vocational Education at the University of Tennessee as an EPDA Fellow; and with the Vocational Education Department for the State of Tennessee. Upon graduating from the University of Tennessee, Dr. Hinson became the Director of Planning for the Winston-Salem/Forsyth County Schools, Winston-Salem, North Carolina.

In August, 1974, Dr. Hinson assumed his present position as Systems Analyst with the Vocational-Technical Education Consortium of States. His primary responsibility is to provide member states with the appropriate data analysis for their products, thereby enhancing decision-making capabilities.

CONNIE R. WARREN, RESEARCH SPECIALIST

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Warren holds a Ph.D. degree in Education, a M.S. degree in Computer and Information Science, and a B.S. degree in Mathematics from the Ohio State University, Columbus, Ohio.

TEACHING EXPERIENCE: As a graduate teaching assistant, Dr. Warren assisted faculty members in teaching courses in elementary statistics, research design, and proposal writing. Four years were spent as an instructor in FORTRAN language programming and as a computer consultant.

EMPLOYMENT: Dr. Warren was formerly employed as a Research Specialist in the Evaluation Division at The Center for Vocational Education, Columbus, Ohio. During this time, she had major responsibility for planning and conducting a nationwide field tryout to evaluate procedures developed for constructing and using occupational task inventories. She has also served as a research design consultant, interviewer on several research projects, and a computer programmer.

In November, 1974, Dr. Warren assumed her present position as Research Specialist with the Vocational-Technical Education Consortium of States. In this capacity, her primary responsibilities are for planning and conducting research activities in the performance objectives and criterion-referenced measures domain and assisting in the design of the computer-base of the project.

BILLY J. KOSCHESKI, TECHNICAL SPECIALIST

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
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EDUCATION: Mr. Koscheski holds a B.A. degree from Park College, Parkville, Missouri.

TEACHING EXPERIENCE: Mr. Koscheski served four years as an instructor in the Administrative Specialist Course, United States Air Force. He has also conducted various workshops on the development and maintenance of criterion-referenced instructional systems.

EMPLOYMENT: Mr. Koscheski spent 22 years (1952-1974) in the United States Air Force, during which time he served in the Administrative and Instructional System Development fields. His last 10 years in the military were spent developing and analyzing criterion-referenced instructional systems.

In September, 1974, Mr. Koscheski assume his present position as Technical Specialist with the Vocational-Technical Consortium of States. In this capacity, his primary responsibility is to assist member states in the development of performance objectives and criterion-referenced measures, thus forming a solid base for curriculum development.

LeROY M. NETRICK, TECHNICAL SPECIALIST

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
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SOUTHERN ASSOCIATION OF COLLEGES
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EDUCATION: Mr. Netrick holds a B.S. degree in Education from West Texas State University, Canyon, Texas, and a M.D. degree in Educational Administration from Denver University.

TEACHING EXPERIENCE: Mr. Netrick served 18 years as an instructor in mathematics and teacher education in the United States Air Force, and taught for seven years secondary level mathematics and vocational education in public schools.

EMPLOYMENT: Mr. Netrick spent 22 years in the United States Air Force (1950-1972), was a field representative for a major publisher, worked as a Coordinator of Instruction, and as a Principal for an Adult Education Program for six years.

In November, 1973, Mr. Netrick assumed his present position as a Technical Specialist with the Vocational-Technical Education Consortium of States. His duties include maintaining uniform procedures throughout V-TECS projects, technical assistance to member states, and providing assistance in statistical design and analysis.

APPENDIX "D"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

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VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

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APPENDIX "E"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES
MEMBERS OF THE
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VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

COMMITTEE MEMBERSHIP

STANDING COMMITTEES

BYLAW AND POLICY COMMITTEE

Dr. Roy Giehls, Chairman
Dr. Gary Beasley
Dr. Ben A. Hirst, Jr.*
Mr. Paul Scott

COPYRIGHT COMMITTEE

Mr. Paul Scott, Chairman
Miss Ruth Stovall
Mr. George Wallace

DISSEMINATION, IN-SERVICE, AND DIFFUSION COMMITTEE

Mr. Paul Scott, Chairman
Dr. Kenneth M. Eaddy, Special Consultant
Dr. Roy Giehls
Mrs. Emily T. Owens
Mr. Robert Spillman
Dr. James Wall

CATALOG FORMAT COMMITTEE

Dr. Kent Brooks, Chairman
Dr. Robert T. Benson
Dr. Bruce Carpenter
Dr. Bettye Hirst

* Executive Director of V-TECS serves as Ex Officio Member of all committees.

AD HOC COMMITTEES

"BEYOND THE CATALOG COMMITTEE"

Dr. Dale Oliver
Mr. Kirby Awagain
Mr. W. H. Fitz
Miss Ruth Stovall

PLANNING COMMITTEE FOR V-TECS/U.S.O.E. PROJECTS

Dr. Ben A. Hirst, Jr., Chairman
Mr. W. H. Fitz
Mr. Robert Miller, Resource Consultant
Mr. Paul Scott
Dr. James Wall

APPENDIX "F"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES
MODEL AND MASTER SEQUENCE CHART

ACTIVITY MODEL FOR VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

Activity Number I--Determination of Priorities and Assignment of Catalogs

This activity is the first step for developing catalogs of performance objectives and criterion-referenced measures. The activity has four basic sub-activities which form the rationale and consensus for catalog priority identification and assignment to the member states of V-TECS.

Sub-Activity I-1--State Priority Determination

The member states study data available to them concerning manpower needs, employment opportunities, and student interest surveys to establish a priority list within the state for catalogs of performance objectives and criterion-referenced measures. A state may consider regional and national data to determine its priorities or any other information which it deems necessary or appropriate.

Sub-Activity I-2--Consortium Priority Determination

The Board of Directors of V-TECS will discuss, in turn, the priorities established by each member state. The purpose of this structured discussion is to develop a priority listing from which the member states may select and be assigned a certain number of catalogs to develop. This sub-activity is to assure that duplication does not occur and that a state has the opportunity to negotiate for specific catalogs in which it has a particular interest or for which considerable work has already been accomplished.

Sub-Activity I-3--Resolution of Conflict and Exchange of Previous Work Related to Catalogs to Be Developed

Should states not be able to resolve priority preference conflicts, a drawing of assignments will be conducted by the Board of Directors. In case a state does not get its desired priority area for reasons identified by the Board of Directors, a copy of such accomplished work would be provided to the state assigned the catalog area in dispute. This material will be included as an essential part of the state-of-the-art study to eliminate duplication of effort.

Sub-Activity I-4--Assignment and/or Selection of Catalogs

The Board of Directors makes the decisions concerning the final selection and/or assignment of catalogs after state and consortium priorities have been determined. Two primary considerations are given member states on the selection of a catalog:

(1) the state has a particular interest in a domain area;

(2) the state has accomplished or has in progress considerable work in a domain area which would benefit the Consortium.

Catalogs assigned by the Board of Directors of the Consortium are subject to acceptance by the state involved in the assignment.

Activity Number II--The Memorandum of Agreement

A Memorandum of Agreement is entered between the state selecting or being assigned a catalog to develop and the Consortium. The parties of the Memorandum of Agreement are the Chairman of the Board of Directors of V-TECS, the Executive Director of V-TECS, and the person designated by the State's Plan for Vocational Education as the State Director of Vocational Education. This activity has three sub-activities which must be completed prior to the developmental work on a catalog and they are as follows.

Sub-Activity II-1--Minimum Contents of the Memorandum of Agreement

The Memorandum of Agreement will be developed by the Consortium staff, and after a period of time, will be standardized. The Memorandum of Agreement will contain the following minimum items:

(1) date and name of catalog domain area including job titles to be surveyed

(2) designated signature blanks

(3) specific delivery dates for:

  (a) domain study and task lists

  (b) task analysis and survey results

  (c) catalog of performance objectives and criterion-referenced measures

  (d) field test period

  (e) final catalog and field test results

(4) responsibilities of a full-time technical coordinator in the state and to the Consortium

(5) Consortium staff involvement in the development of catalogs and the development of in-service training and dissemination plans.

Sub-Activity II-2--Processing the Memorandum of Agreement

The Memorandum of Agreement will take the following course for development and approval.

(1) format developed and prepared by the Consortium staff
(2) Memorandum of Agreement reviewed and signed by the Chairman of the Board of Directors and the Executive Director of V-TECS
(3) Memorandum of Agreement mailed to the states for review and signature by the State Director of Vocational-Technical Education
(4) designated copies distributed and project starts
(5) periodic PERT reports are mailed to states on request.

Sub-Activity II-3--Selection of a Project Director

Each state developing a catalog of performance objectives and criterion-referenced measures will select a person to serve as project director. The project director selects and manages writing teams which are composed of selected instructors in the domain being developed. These writing teams are trained by the project director and state technical coordinator to analyze the data resulting from the occupational analysis system, the findings of the state-of-the-art study, and other pertinent information. The project director is responsible for submitting to the state technical coordinator results of studies and analyses of data, catalogs of performance objectives and criterion-referenced measures, and other products required by the Memorandum of Agreement. The project director will meet the same qualifications established by the Board of Directors of V-TECS for the technical coordinator in each state.

Activity Number III--Technical Preparation of V-TECS Staff and State Coordinators

The technical preparation and training of the Consortium staff and the technical coordinators in the states are paramount to maintaining quality control. A program of technical development will begin with an orientation to the model to insure that technical skills and knowledge are sufficiently developed to provide maximum quality control. This activity is divided into six sub-activities which form the basis for staff preparation and training and are as follows:

Sub-Activity III-1--System Orientation

A program designed to insure the performance of Consortium staff and technical coordinators will be administered. The orientation is in performance terms with each person satisfactorily completing the required tasks at a criterion-based performance level. Orientation to the system will not be considered complete until the performance standards are met by the Consortium staff and the technical coordinators.

Sub-Activity III-2--Determining Decision Criteria

The Board of Directors and the staff of V-TECS will develop the decision criteria to be used in the determination of tasks to be converted to performance objectives for cataloging. The decisions will be based upon cut-off indices of time-spent, difficulty, criticality, and task perishability. Other bases for decision criteria may be developed by the Board of Directors based upon research of the data resulting from the surveys of the incumbent workers and their immediate supervisors.

Sub-Activity III-3--Interpretation of Task Analysis Data

An intensive training plan will guide the preparation of Consortium staff and personnel within the states to effectively utilize the data from the task analysis system. This training will assist personnel in the determination of index measures of tasks which are sufficiently high to use in a catalog. Optimum index rating scores will be developed when experience demonstrates that such a rating is feasible. Any tasks which fall below the desired index rating or combination of indice ratings will be excluded from conversion to performance objectives. Continuous training will be conducted for personnel as the task analysis system develops and the analysis of the research indicates a need for further training.

Sub-Activity III-4--Developing Skills in Writing Performance Objectives

Workshops, seminars, and conferences will focus on the development of skills needed to write performance objectives. Consortium staff and technical coordinators will be expected to demonstrate their ability to take a given set of task statements and data, then develop written performance objectives and criterion-referenced test items.

Sub-Activity III-5--Writing of Criterion-Referenced Test Items

Following the training of the staff and technical coordinators in the skills of writing performance objectives from task analysis data and task statements, intensive efforts will be introduced to develop companion criterion-referenced test items(s) for each performance objective. A task statement will yield one or more performance objectives and a performance objective will yield one or more criterion-referenced test items. Criterion-referenced test writing experts will serve as consultants for training Consortium staff and state technical coordinators. Personnel will either be sent to the source of technical expertise or the experts will be assembled in conference, seminar, or workshop settings.

Sub-Activity III-6--Monitoring and Quality Control of Personnel, Education, and Training

The Consortium staff and state technical coordinators will develop individual plans of technical preparation for themselves under guidelines developed by the Board of Directors of V-TECS. These plans would serve as a guide to insure minimum competence levels of personnel of the Consortium staff and within the states. The Executive Director of the Consortium has the ultimate responsibility for monitoring individual training programs of the Consortium staff and state technical coordinators in the states. The Board of Directors will receive at least a biennial status report of the technical preparation activities designed for individual Consortium staff and technical coordinators within the states. Reports of this nature may be requested any time the Board of Directors desires to know the status of the total plan or individual progress of personnel.

Activity Number IV--Domain Study for Catalog Development

The domain study consists of thorough and organized research of what has been developed in performance objectives and criterion-referenced measures which might be appropriate and helpful during the development of a catalog. A domain consists of a broad instructional area (such as automotive mechanics) and should include appropriate job titles (e.g., automotive tune-up mechanic, service station mechanic, service station attendant, front end and brake mechanic, general automotive mechanic). Activity IV consists of at least four sub-activities.

Sub-Activity IV-1--State-of-the-Art Study

This activity increases the probability that Consortium projects will find material which has already been partially or fully developed by others in a domain area. The state-of-the-art study will include the following research activities as a part of the states' development of catalogs:

(1) a search of the ERIC system for germane information

(2) a search of the journal index of ERIC for germane articles

(3) inquiries to the U. S. Office of Education, National Center for Curriculum Development in Occupational Education

(4) selected inquiries to state departments of education for germane material

(5) inquiries to industry and private training institutions

(6) review of the Dissertation Abstract International Index

(7) inquiry to local education agencies identified as working on germane projects.

Sub-Activity IV-2--Task List Development

A comprehensive list of tasks performed by the incumbent workers will be developed as a part of the domain study. The task list will be based upon research completed in the state-of-the-art study (Sub-Activity IV-1) and, in addition, will include the following:

(1) a job structure arranged from the lowest job titles to the highest job title within a domain

(2) a coding system developed by the Consortium and identifed in the Dictionary of Occupational Titles will be applied to the job structure

(3) development of a task list using the following sources for obtaining task statements:

  (a) review and observation of technical procedures used by workers

  (b) identification of existing task lists or statements from technical manuals and germane literature

  (c) interviews with incumbent workers and their immediate supervisors

  (d) use of craft committees and selected committees of instructors to identify incumbent worker tasks

  (e) provision of space for a survey of incumbent workers to add task statements not included on the list.

Sub-Activity IV-3--Development of Background Information

This part of the domain study will be used in conjunction with the task list to provide data which may be cross-tabulated and studied with the companion task lists. The background information section will include as a minimum:

(1) information about the incumbent worker and/or supervisor
  (a) name and address of incumbent worker
  (b) date survey complated by incumbent worker
  (c) job title or classification
  (d) years and months of experience in career field
  (e) years and months of experience in present job title or classification
  (f) previous vocational-technical training
  (g) private or public school attendance
  (h) highest grade level completed or GED equivalent
(2) information about job satisfaction
(3) information about utilization of talents and prior training
(4) list of equipment and tools used in the jobs of the domain
(5) type of work environment of the incumbent worker
(6) size of business or industry.

Sub-Activity IV-4--Reports of the Domain Study

The following reports will be required of the domain study activity:

(1) State-of-the-Art Study--This report includes the methods used to meet the requirements of Sub-Activity IV-1, (1), (2), and (3) of the model.

(2) Background Information and Task List--This report includes a comprehensive setion on background data to be completed by all incumbent workers who are surveyed. Following this section will be a comprehensive task listing which each incumbent worker will be asked to verify in his job classification. He will also be given the opportunity to add any task he is performing which is not included. The background information and task lists will be printed, in booklet form, in a standard format set by the Consortium staff and approved by the Board of Directors.

Activity Number V--Development and Implementation of the Domain Sampling Technique for the Task Statement Survey

The purpose of this activity is to obtain a sample of incumbent workers by a domain area and collect certain information from those sampled to be used later in a task analysis. Survey booklets of task statements are developed and printed using a standard format for the background and task statement information. The sampling design would be developed by an independent agency. This activity is divided into three sub-activities dealing with the sample design, sample administration, and processing of the survey results. Alternative procedures are included as a part of Sub-Activity V-1 and Sub-Activity V-2.

Sub-Activity V-1--Design of the Sample

(a) Optimum sample design--The optimum sample design consists of administration of the task statement survey to stratified random sampling of incumbent workers holding a job classified within the domain. The base data is to be used in determining the sample size will be the occupational information (coded from the Dictionary of Occupational Titles) collected during the 1970 Census of the United States. The body of the information collected will be statistically analyzed with inferences made to the population. (All workers in the United States in a given job classification within a specific domain.)

(b) Alternative sample design #1--The alternative sample design #1 collects information using the same base data as in V-1 (a) but limits the sample to the member states of the Consortium and makes no inferences beyond those states not included in the survey.

(c) Alternative sample design #2--The alternative sample design #2 collects information using the same base data as in V-1 (a) but limits the sample to the state which is developing a task survey in a particular domain. A purposive sample could be used by any state desiring to validate task lists within a state not included in the survey.

Sub-Activity V-2--Administration of the Occupational Analysis Survey

(a) Optimum administration--The optimum administration of the survey would be conducted through a central staff in the Consortium office. This would permit control of the follow-up letters, follow-up telephone calls, and general sequence timing of the surveys. Limitations exist in the application of the optimum administration which are proportionate to the activities selected in Sub-Activity V-1.

(b) Alternate administration--An alternative method of administration would be to have each state which develops the task statement lists also conduct the survey of incumbent workers based upon the selection of the sample design in Sub-Activity V-1. This method is based upon a thorough development of a sampling administration criteria which will be used in the survey efforts. A sub-sample will be selected and individually interviewed on the work site to compare with the results of the mail-out survey.

Sub-Activity V-3--Processing the Survey Results

The results of the survey will be keypunched or optically scanned and computerized. Various analyses will be made of the data to make decisions about tasks performed by incumbent workers. These survey results will provide the basis for writing performance objectives and criterion-referenced test items. Indices of time-spent, difficulty, criticality, and perishability will provide the basis for strategic decision making. The analysis will be accomplished by using computer programs designed by the U. S. Air Force for this purpose.

Activity Number VI--Occupational Analysis System

The backbone of the Phase II Model is the system used to develop scientific task analysis information based upon a direct survey of incumbent workers. This effort should affect the quality, realism, and scope of the catalogs of performance objectives. The basic source document for the task analysis system is the task statement survey and background information collected from the incumbent worker. Activity Number VI has five basic sub-activities which make up the system of task analysis. These sub-activities have to do with computed indices of task time-spent, task difficulty, task criticality, task perishability, and computer analysis and reporting.

Sub-Activity VI-1--Task Time-Spent Index

The incumbent workers complete the background information and check the tasks they actually perform in the task statement booklet. After checking the task statement, the incumbent worker rates the relative amount of time spent on the task along a seven-point scale. The response on the scale is converted to a time-spent index based on percentages over the total group of task statements checked. The resulting percentage figure is cumulative to 100 percent on all tasks checked. This conversion of information and calculations is accomplished by use of a computer.

Sub-Activity VI-2--Task Criticality Index

The incumbent worker rates a task in terms of its critical performance. The primary interest of this part of the task analysis is to ascertain by use of a seven-point scale the relative critical values of each task. When obtained, the index of criticality can be applied to the development of performance objectives. A thorough review of this critical index will identify the tasks which are most critical in descending order to those which are considered least critical. On the basis of these data, determination can be made regarding the consequences of a poor performance of the critical tasks.

Sub-Activity VI-3--Task Difficulty Index

The same process is used to calculate an index of task difficulty which is used in the determination of the time-spent index. A seven-point scale is again employed to determine the incumbent worker's perception of task difficulty. One additional step is included to determine the task difficulty index. The task statement survey is also administered to the immediate supervisor of the incumbent worker. The responses are then correlated, and the resulting figure becomes the difficulty index.

Sub-Activity VI-4--Task Perishability Index

The same sampling technique and incumbent workers are used to obtain a perishability index. This index is a measure, on a seven-point scale, of the relative perishability of a task statement currently being performed by the incumbent workers participating in the survey. This index will relate to the need for retraining or refresher courses should the worker not perform, on a continuous basis, those tasks which are rated to have high indices of perishability. One implication of this type of index is to provide guidance for development of self-paced instructional packages which have as a basis the tasks which have the higher perishability indices. Retraining and development of materials could be minimized by including objectives for tasks which have high indices of perishability.

Sub-Activity VI-5--Processing of Data and Development of Reports

The information collected from Sub-Activity VI-1. VI-2, VI-3, and VI-4 will be computerized for statistical analysis. Information will be translated from qualitative data to quantitative data. The quantitative data will produce the index values of time spent, criticality, difficulty, and perishability. Many other statistical analyses can be applied to the data for the purpose of rank ordering, multiple regression analyses, cross tabulation of tasks with elements and sub-elements of the background information, etc. The resulting printouts will be furnished to the state developing the catalog of performance objectives and criterion-referenced measures as a basis for their developmental activities and decision making.

Activity Number VII--Development of Catalogs of Performance Objectives and Criterion-Referenced Measures

The activities prior to Activity VII have emphasized primarily the training and preparation of personnel, the collection and analysis of information, and other preliminary steps necessary to write and catalog performance objectives and criterion-referenced measures. This activity is the application state of the model. Information from incumbent workers is combined with the knowledge of selected instructors, curriculum specialists, criterion-referenced test designers, and educational researchers to transpose the resulting data into meaningful test items. Activity VII contains four sub-activities designed to accomplish this task which are as follows:

Sub-Activity VII-1--Selection and Preparation of the Writing Teams

(1) Selection of Writing Teams--The project director and technical coordinator screen possible writing team candidates and select those instructional personnel which they determine have the potential and interest to write performance objectives and criterion-referenced measures. The writing team will consist of a minimum of one instructor, one technical writer, one person having demonstrated ability and experience in developing criterion-referenced measures and one person

having either local or state supervisory responsibility over the domain being developed. Each writing team should have a preferred alternate member who has responsibility in curriculum development at the local or state level. Exceptions to the writing team composition will be made upon request by the state developing the catalog. The request will be transmitted to the Board of Directors with appropriate justification for the exceptions. Decisions will rest with the Board of Directors.

(2) Preparation of Writing Teams--The state technical coordinator will have the primary responsibility of assisting the project director in the training of the writing team members. The total design of the model will be explained--the results of the state-of-the-art study, the task analysis system, and the conversion process from task statements to performance objectives. Companion criterion-referenced measures will be prepared for each performance objective incorporating performance standards which are used on the job when these standards are available. Components of the training program developed for the Consortium and state technical coordinators will be used as the basis for training and preparing the writing teams for their tasks.

Sub-Activity VII-2--Writing Performance Objectives

All performance objectives developed by the writing teams will meet the definitions and quality criteria set forth in the Memorandum of Agreement. The components of the performance objective will contain the following requirements: situation confronting the learner, action required of the learner, object on which learner is to operate, limits of performance, measurability of the action, communicability of the objective, and degree of proficiency required of the learner.

Sub-Activity VII-3--Preparing Criterion-Referenced Measures

Each performance objective will have one or more companion criterion-referenced test items to be used by instructional personnel. The test items will be studied to insure that a definite relationship exists between the criterion-referenced item and the standard of performance stated in the performance objective. The definition and components of an acceptable criterion-referenced measure are spelled out in the Memorandum of Agreement and will include: congruence with the performance objective, comprehensibility (expressed at a proper reading level for the level of the training program), objectivity of the test item, integrity expressed in terms of sufficient evidence that the learner can perform the corresponding objective, and equivalence within the test items. The criterion-referenced test item will be developed by the writing teams which develop the performance objectives under the technical direction of the person on the team with test item experience, the director of the project, the technical coordinator in the state, and the technical specialist on the Consortium staff. Particular emphasis would be placed upon explicit information concerning criterion of performance on-the-job and conditions under which performance occurs. Standards would be based upon those used by business and industrial workers.

Sub-Activity VII-4--Developing the Catalog of Performance Objectives and Criterion-Referenced Measures

The performance objectives and criterion-referenced measures will be coded by job classification within the domain being developed. This coding system will be developed by the Consortium and applied to all products of the Consortium. Catalog format and content are outlined in detail and are available through the technical coordinator in each state. All catalogs will be furnished in final draft form (camera ready) for mass production.

Activity Number VIII--Field Testing and Commonality Study

This activity is designed to determine the instructional acceptability of the performance objectives and criterion-referenced measures. The degree of validity will be determined by analysis of teacher and instructor responses to questions during the field test portion of each project. Field test sites and conditions will be selected by the application of a criterion developed by the Board of Directors, Consortium staff, and technical coordinators. Activity VIII consists of four sub-activities as follows.

Sub-Activity VIII-1--Field Testing Design

The field test is designed to control the variables under which the catalogs will be tried by teachers and instructors. Controls are placed upon the selection of the site of field testing, supervisory and administrative support and interest, instructor or teacher interest and ability, type of facilities and equipment, and level of students (junior high schools, secondary, post-secondary, etc.). The primary emphasis is placed upon determining comprehensibility, utility, and appropriateness for instruction as perceived by the teachers and instructors. Constraints which prevent the use of a given performance objective and companion criterion-referenced measures are identified by the instructional personnel.

Sub-Activity VIII-2--Commonality Review

During the field test, several reviews of performance objectives are made by teachers and instructors for the purpose of identifying the common performance objectives across a wide group of occupational education programs. This commonality study identifies those common performance objectives within the catalog which are applicable in several occupational domains. The common core identified is analyzed for implications for curriculum design in general shop, pre-vocational, and comprehensive career education programs.

Sub-Activity VIII-3--Evaluation of Criterion-Referenced Test Items

A jury including an incumbent worker, a criterion-referenced test item writer, an instructor in the catalog domain area, and a supervisor of the incumbent workers represented would be used to make a final review of the criterion-referenced test items. The primary purpose of this activity will be to reach congruence on the behavior being tested and to permit inference of competence should the learner meet the specified performance.

Sub-Activity VIII-4--Determination of Performance Objectives and Criterion-Referenced Measures Which are Applicable to Handicapped Persons

The field test version of the catalog of performance objectives and criterion-referenced test items will be reviewed by a committee of persons to determine their applicability to the training of handicapped persons. The appropriate performance objectives and criterion-referenced test item will be coded for each of the specific types of handicapped persons, i.e., partially sighted, speech defects, hard of hearing, crippled, and mentally retarded, etc. A special review committee for the handicapped will consist of a curriculum developer, an instructor from the catalog domain area and a representative of each of the handicapped groups who has the ability to determine the training limitations of handicapped persons in each group. The work of the committee will be coded and computerized for retrieval for use in planning realistic training programs for the handicapped.

Activity Number IX--Computerize Performance Objectives and Criterion-Referenced Measures

The primary purpose of this activity is to provide immediate response to the states' requests for catalogs. The computer banking of performance objectives and criterion-referenced measures eliminates the time-consuming and costly step of technical editing each time a catalog is revised and updated. Since only those objectives actually changed will be accessed from the computer, the majority remain unchanged and may be retrieved and printed in the same manner each time. Research capabilities, as well as many management possibilities, exist when the computer is used to do time-consuming calculations, compiling, and cataloging of performance objectives and criterion-referenced measures. This activity contains four sub-activities as follows:

Sub-Activity IX-1--Developing Computer Bank of Performance Objectives Objectives and Criterion-Referenced Measures

After field testing, the catalogs of performance objectives and criterion-referenced measures are processed and placed in a computer bank for rapid retrieval. The coding system adopted by the Consortium is the key to the retrieval system for the computerized information. The information is arranged so that it may be retrieved by domain area or any coded job within a domain. A member of the Consortium may request the total catalog or any of its sub-parts for use in curriculum design and curriculum building. Information is recorded concerning the perceptions of the teachers and instructors during the field test and commonality review. These perceptions concern the comprehensiveness, utility, and appropriateness of the performance objectives and criterion-referenced measures for instruction. In addition, the perceptions concerning the commonality of performance objectives, across several programs in occupational education, are collected for analysis.

Sub-Activity IX-2--Research Aspects of the Computerized Performance Objectives and Criterion-Referenced Measures

(1) Field Test Data--Information collected during the field test activity is analyzed by the computer. The purpose of this analysis is to identify those performance objectives and criterion-referenced measures which appear to be defective. When the defective objectives

and measures have been identified, they are forwarded to the state which developed the catalog with instructions for removing the possible defects.

(2) Commonality Review--The results of the commonality review by teachers and instructors form the basis for the identification of core performance objectives. This common core provides a basis for planning curriculum for pre-vocational, general shop, related subjects, and career education programs. These common performance objectives also provide a framework for prerequisite skills, knowledge, and abilities needed by students to further their preparation for employment at a higher level.

(3) Cross-Analysis Research--Computer programs will be utilized which cross-tabulate and cross-analyze data received from teachers and instructors with data collected from the task analysis based upon surveys of incumbent workers and their immediate supervisors. The research implications of these data are unlimited when incorporated into the Revision and Updating Activities of the model.

Sub-Activity IX-3--Management of Performance Objectives and Criterion-Referenced Measures

The application of a code number to each performance objective, which relates it to a specific domain and, within the domain, to a specific job classification, provides an added degree of manageability. The performance objectives will be retrieved from the computer bank by job classification, by total domain, by commonality elements, or other mixes required for planning various training programs. The computer can be used to compile the catalog by printing out performance objectives in any desired structure or sub-structure within a domain. Training programs for a new or expanding industry may be designed and retrieved from the computer and can provide those performance objectives which correlate with the job structure of the new industry. The resulting performance objectives provide a realistic planning base for curriculum which must be tailor-made for the task at hand. Many other curriculum management advantages can be developed upon this computer bank of performance objectives. The curriculum design implications are limited only by financial resources and human ingenuity.

Sub-Activity IX-4--Development of Special Reports for Training the Handicapped Learner

The information collected from the work of the special committee for the handicapped (Sub-Activity VIII-4) would be computerized and used as a research base for developing, planning and organizing training programs and activities for the handicapped learner. The performances specified in the objectives and criterion-referenced measures could be modified to permit handicapped workers to demonstrate their ability in terms of particular job titles. Other valuable research could be accomplished by using the data concerning the abilities of the handicapped and comparing it with background information from the incumbent workers and their immediate supervisors.

Activity Number X--In-Service Education and Dissemination Plans

Each state using the materials of the Consortium will develop a comprehensive model for disseminating the catalogs of performance objectives and criterion-referenced measures. In addition, a comprehensive in-service training program must be developed which is designed to prepare both instructional personnel and supervisory personnel in the techniques of managing performance-based instruction. Performance-based instruction requires a thorough knowledge and new skills for teachers and their managers if it is to achieve the desired results. This activity contains sub-activities which are directed toward the achievement of an acceptable degree of implementation of performance-based instruction in the classrooms, laboratories, and shops of participating states.

Sub-Activity X-1--In-Service for Curriculum Developers

Specific programs will be planned for preparing curriculum developers concerning the use of catalogs for organizing learning activities. These programs are to be planned jointly with Consortium staff and include a comprehensive explanation of the system used to develop catalogs, the skills required for retrieving appropriate performance objectives and criterion-referenced measures, and the management strategies necessary to implement a performance-based curriculum effort in the classroom and laboratory. Strategies will also be included to provide direction in the organization and preparation of learning activities.

Sub-Activity X-2--In-Service Education for Teachers and Supervisors

A requirement of Consortium membership is the development, by each state, of an in-service education program for teachers and managers of teachers who will begin to use the catalogs of performance objectives and criterion-referenced measures. The in-service program should be designed to instruct personnel on the intention of the catalog, how to select performance objectives and criterion-referenced measures, and how to supplement their selection with curriculum materials and student learning activities. Those who supervise, direct, or administer programs and have direct contact with the teacher who will be using the material should be trained in the management aspects of performance-based instruction. The basic requirements of the in-service education plan are developed and/or modified by the Board of Directors of V-TECS.

Sub-Activity X-3--Dissemination of Materials

A dissemination outline to be developed by the Board of Directors of V-TECS should serve as a guide for the states. The specific methods of dissemination are left entirely to the participating states. The Consortium staff will assist the states as needed and will encourage the dissemination plan to be integrated with the in-service education plan when at all possible. This integration should insure proper preparation of the users and managers of the learning process and, at the same time, provide a logical point of dissemination.

Activity Number XI--Revision and Updating of the Catalogs

The rapid rate of change in a technical society mandates a better way of keeping vocational-technical instructional materials up-to-date;

but, more importantly, it mandates keeping them relevant to the needs of a modern job structure. This activity is designed to maximize input from instructional personnel, craft advisory committees, and the incumbent worker so that catalogs may be revised on a scientific and as-needed basis. This activity contains four sub-activities which form a cycle for revising and updating the catalogs. The cycle will take approximately three years to complete with a decision to revise and update or not to revise and update at the eighteen-month point in the cycle.

Sub-Activity XI-1--Field Utilization Study

Continuous field study is made regarding the catalogs of performance objectives and criterion-referenced measures. The purposes of the field study are to: (1) detect the defective performance objectives and criterion-referenced measures, (2) identify additional performance objectives which may need to be added to the catalog when it is revised, and (3) obtain a wider participation in the developmental activities, particularly in the area of curriculum materials.

The field utilization study has two major components for achieving the purposes:

(1) Teacher and Curriculum Developer Inputs--During the first year of use, the teachers and curriculum developers will be asked to react to questions concerning readability, comprehensibility, specificity, and appropriateness of performance objectives and criterion-referenced measures. This information is added to the body of data already existing on the performance objective as a result of the commonality study and the field test results.

(2) Craft Advisory Committee Inputs--Early in the second year, the craft advisory committees for the programs using the material review each performance objective and respond to questions concerning (a) the utility of the performance objective, (b) the appropriateness for present job requirements, (c) the extent to which the performance objective is accomplished by entry level employees, relatively experienced employees, and experienced employees, and (d) the relative criticality of the performance objective.

Sub-Activity XI-2--Analysis of Data from Field Utilization Study

The information collected from the field utilization study is computerized, and reports are developed to determine the results. Statistical analysis is applied to the data to accomplish the purposes of the field utilization study. Data are compared with the results of Sub-Activity XI-3, survey of incumbent workers, for the purpose of deciding whether the catalog should be revised and updated or if it is still sufficiently valid for continued use.

Sub-Activity XI-3--Conducting New Task Analysis

The same procedure used in Activity VI, task analysis system, is used at the twenty-fourth month point in the revision and updating cycle. The same task statements are used with the exception that those added by incumbent workers on the initial survey are included for this survey application.

Additional information requested of the incumbent worker is that he add any tasks he is now doing which do not appear on the list and place an asterisk by those task statements which he has begun to perform for the first time during the last twelve months.

Sub-Activity XI-4--Decision Criteria for Revising and Updating Catalogs

The information collected on the new task analysis is computerized and analyzed. The purpose of the analysis is to determine the extent of new tasks identified by incumbent workers which have been accomplished the first time during the immediate past twelve months. A review of the results of the field utilization study (Sub-Activity XI-1) and the survey of incumbent workers forms the basis for the decision regarding the need for revision and updating of the catalogs or portions of the catalogs. If the data suggests a need for revision, the catalogs are put through the same process as for their initial development.

Activity Number XII--Third Party Evaluation of the Vocational-Technical Education Consortium of States

Evaluation of the Consortium on a biennial basis is considered desirable by the Board of Directors of V-TECS. A third party evaluator will be selected on a low bid basis from a group of competent and qualified evaluators. This type of assessment has important advantages and will serve as a basis for self-renewal. This activity contains three sub-activities which are as follows.

Sub-Activity XII-I--Selection of the Evaluation Team

The Board of Directors of V-TECS will select a qualified low bidder as a third party evaluator from states or organizations outside the membership to evaluate and make recommendations concerning the total organization and its procedures. This evaluation shall occur within the first two years of the operation and every two years thereafter. The Board of Directors selects and employs the evaluators and sets guidelines for their study. These guidelines will be used as a basis for developing a well-defined and congruent request for proposals.

Sub-Activity XII-2--The Evaluation and Report of Results

The evaluation is conducted by a team selected by the Board of Directors. The chairman of the evaluation team will be selected by the successful bidder and the members of the evaluation team. The results of the evaluation are forwarded to the Chairman of the Board of Directors of V-TECS with a copy transmitted concurrently to the Director of the Southern Association of Colleges and Schools, the Executive Secretary of the Commission on Occupational Education Institutions, and the Executive Director of V-TECS.

Sub-Activity XII-3--Implementation of the Recommendations of the Evaluation

The Board of Directors of V-TECS reviews the evaluation results and directs the implementation of the recommended changes as it deems necessary and expedient. The administering agency files its response to the Board of Directors for consideration prior to implementation of recommendations made by the evaluation team.

Figure 6 illustrates the chronological relationship and internal relationship of the activities and sub-activities of the Phase II Activity Model.

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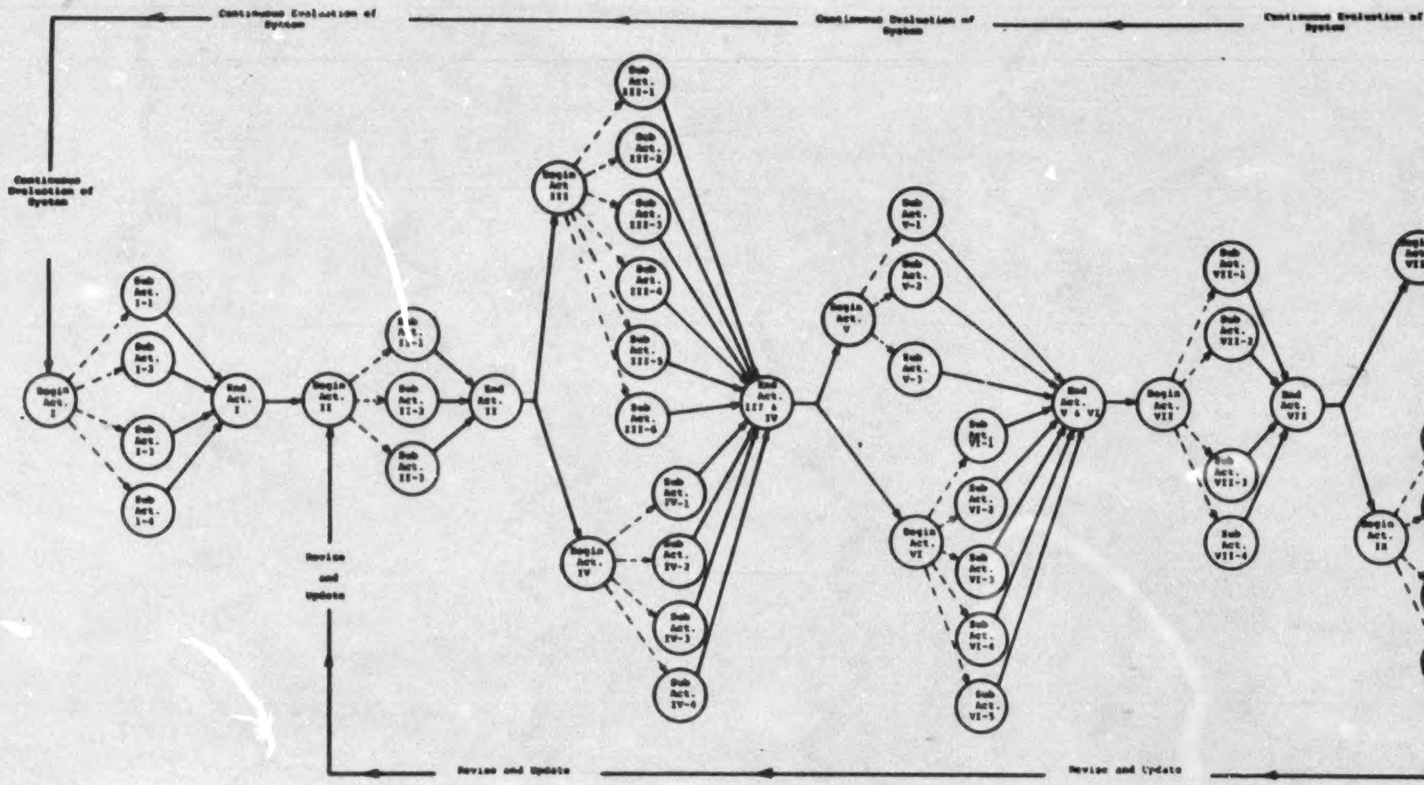


I. DETERMINATION OF PRIORITIES AND ASSIGNMENT OF CATALOGS

- I-1. STATE PRIORITY DETERMINATION
- I-2. CONSORTIUM PRIORITY DETERMINATION
- I-3. RESOLUTION OF CONFLICT AND EXCHANGE OF PREVIOUS WORK RELATED TO CATALOGS TO BE DEVELOPED
- I-4. ASSIGNMENT AND/OR SELECTION OF CATALOGS

II. THE MEMORANDUM OF AGREEMENT

- II-1. MINIMUM CONTENTS OF THE MEMORANDUM OF AGREEMENT
- II-2. PROCESSING THE MEMORANDUM OF AGREEMENT
- II-3. SELECTION OF A PROJECT DIRECTOR

III. TECHNICAL PREPARATION OF V-TECS STAFF AND STATE COORDINATORS

- III-1. SYSTEM ORIENTATION
- III-2. DETERMINING DECISION CRITERIA
- III-3. INTERPRETATION OF TASK ANALYSIS DATA
- III-4. DEVELOPING SKILLS IN WRITING PERFORMANCE OBJECTIVES
- III-5. PREPARING CRITERION-REFERENCED TEST ITEMS
- III-6. MONITORING AND QUALITY CONTROL OF PERSONNEL, EDUCATION, AND TRAINING

IV. DOMAIN STUDY FOR CATALOG DEVELOPMENT

- IV-1. STATE-OF-THE-ART STUDY
- IV-2. TASK LIST DEVELOPMENT
- IV-3. DEVELOPMENT OF BACKGROUND INFORMATION
- IV-4. REPORTS OF THE DOMAIN STUDY

V. DEVELOPMENT AND IMPLEMENTATION OF THE DOMAIN SAMPLING TECHNIQUE FOR THE TASK STATEMENT SURVEY

- V-1. DESIGN OF THE SAMPLE
- V-2. ADMINISTRATION OF THE OCCUPATIONAL ANALYSIS SURVEY
- V-3. PROCESSING THE SURVEY RESULTS

VI. OCCUPATIONAL ANALYSIS SYSTEM

- VI-1. TASK TIME-SPENT INDEX
- VI-2. TASK CRITICALITY INDEX
- VI-3. TASK DIFFICULTY INDEX
- VI-4. TASK PERISHABILITY INDEX
- VI-5. PROCESSING OF DATA AND DEVELOPMENT OF REPORTS

VII. DEVELOPMENT OF CATALOGS OF
CRITERION-REFERENCED MEAS

- VII-1. SELECTION AND PREPA
- VII-2. WRITING PERFORMANCE
- VII-3. PREPARING CRITERION
- VII-4. DEVELOPING THE CATA
  AND CRITERION-REF

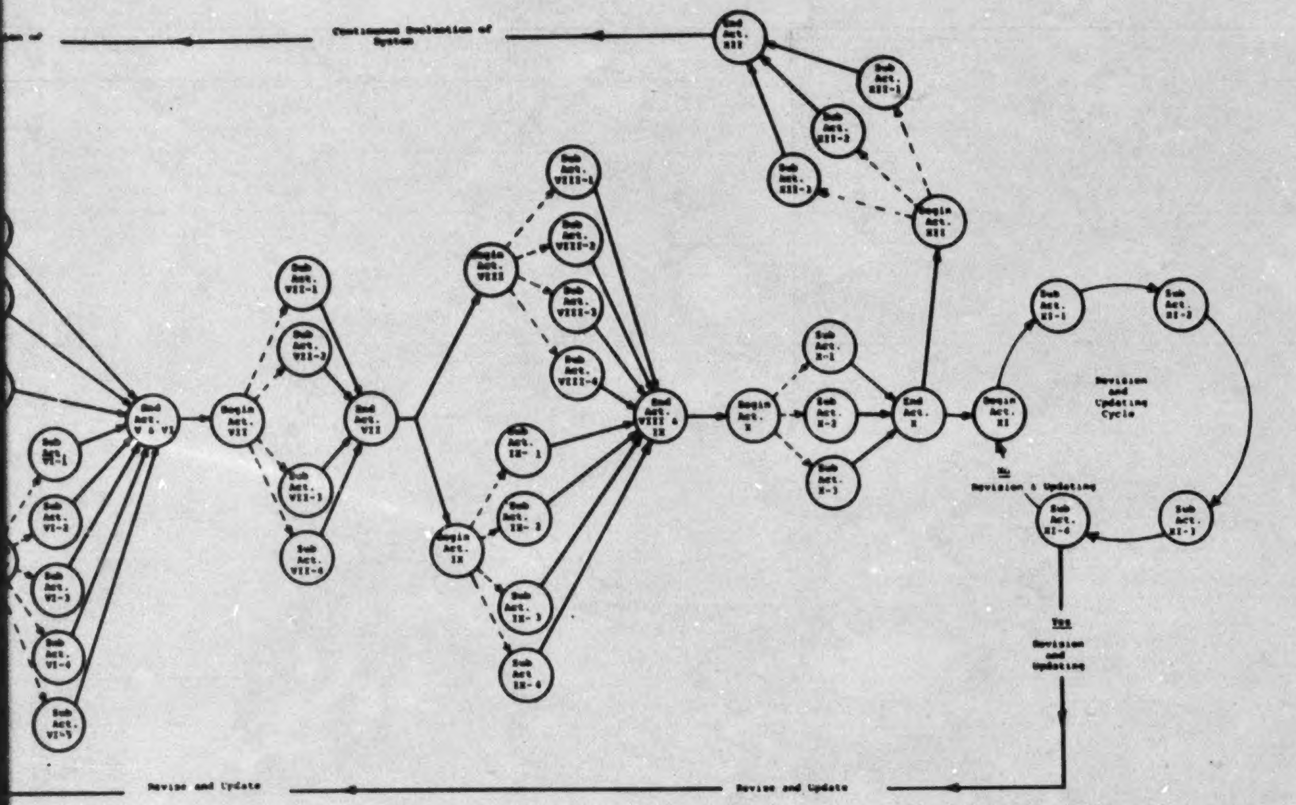
VIII. FIELD TESTING AND COMMONAL

- VIII-1. FIELD TESTING DES
- VIII-2. COMMONALITY REVIE
- VIII-3. EVALUATION OF CRI
- VIII-4. DETERMINATION OF
  CRITERION-REFER
  APPLICABLE TO H

IX. COMPUTERIZE PERFORMANCE OBJEC
MEASURES

- IX-1. DEVELOPING COMPUTER BA
  AND CRITERION-REFERE
- IX-2. RESEARCH ASPECTS OF TH
  OBJECTIVES AND CRITE
- IX-3. MANAGEMENT OF PERFORMA
  REFERENCED MEASURES
- IX-4. DEVELOPMENT OF SPECIAL
  HANDICAPPED LEARNER

Figure 2. Master Sequence Chart



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D INFORMATION
UDY

F THE DOMAIN SAMPLING
NT SURVEY

PATIONAL ANALYSIS SURVEY
LTS

EVELOPMENT OF REPORTS

VII. DEVELOPMENT OF CATALOGS OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES

- VII-1. SELECTION AND PREPARATION OF THE WRITING TEAMS
- VII-2. WRITING PERFORMANCE OBJECTIVES
- VII-3. PREPARING CRITERION-REFERENCED MEASURES
- VII-4. DEVELOPING THE CATALOG OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES

VIII. FIELD TESTING AND COMMONALITY STUDY

- VIII-1. FIELD TESTING DESIGN
- VIII-2. COMMONALITY REVIEW
- VIII-3. EVALUATION OF CRITERION-REFERENCED TEST ITEMS
- VIII-4. DETERMINATION OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES WHICH ARE APPLICABLE TO HANDICAPPED PERSONS

IX. COMPUTERIZE PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES

- IX-1. DEVELOPING COMPUTER BANK OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES
- IX-2. RESEARCH ASPECTS OF THE COMPUTERIZED PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES
- IX-3. MANAGEMENT OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES
- IX-4. DEVELOPMENT OF SPECIAL REPORTS FOR TRAINING THE HANDICAPPED LEARNER

X. IN-SERVICE EDUCATION AND DISSEMINATION PLANS

- X-1. IN-SERVICE FOR CURRICULUM DEVELOPERS
- X-2. IN-SERVICE EDUCATION FOR TEACHERS AND SUPERVISOR
- X-3. DISSEMINATION OF MATERIALS

XI. REVISION AND UPDATING OF THE CATALOGS

- XI-1. FIELD UTILIZATION STUDY
- XI-2. ANALYSIS OF DATA FROM FIELD UTILIZATION STUDY
- XI-3. CONDUCTING NEW TASK ANALYSIS
- XI-4. DECISION CRITERIA FOR REVISING AND UPDATING CATALOGS

XII. THIRD PARTY EVALUATION OF THE VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

- XII-1. SELECTION OF THE EVALUATION TEAM
- XII-2. THE EVALUATION AND REPORT OF RESULTS
- XII-3. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE EVALUATION

APPENDIX "G"

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES
ANALYSIS OF D.O.T. JOB TITLES
BY PROJECT, MARCH, 1975

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

ANALYSIS OF D.O.T. JOB TITLES BY PROJECT

March, 1975

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
		D.O.T. Number	D.O.T. Job
ALABAMA			
Air Conditioning & Refrigeration 17.0100	1111	637.281-010	A/C Mecha
		637.281-034	Refrigera
		620.281-010	A/C Mecha
		637.281-014	A/C Mecha
		827.884-014	A/C Inst
		637.381-010	Evaporato
		637.381-014	Refrigera
		827.381-010	A/C Unit
		827.381-022	Refrigera (Refrig
Radio/TV Repairman 17.1503	1112	720.281-018	TV Servic
		187.168-138	TV Sales
		823.781-018	TV Instal
		822.381-022	Equipment

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

ANALYSIS OF D.O.T. JOB TITLES BY PROJECT

March, 1975

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1111	637.281-010	A/C Mechanic, commercial
	637.281-034	Refrigeration Mechanic, comm.
	620.281-010	A/C Mechanic, auto svs.
	637.281-014	A/C Mechanic, domestic
	827.884-014	A/C Installer, domestic
	637.381-010	Evaporator Cooler Installer
	637.381-014	Refrigerator Unit Repairman
	827.381-010	A/C Unit Tester
	827.381-022	Refrigerator Mechanic (Refrigerator Equipment)
1112	720.281-018	TV Service & Repairman
	187.168-138	TV Sales & Service Supvr.
	823.781-018	TV Installer
	822.381-022	Equipment Installer

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'	
		D.O.T. Number	D.O.T.
Alabama (continued)			
		720.281-022	TV Svs
		720.281-010	Radio R
Nurseryman 01.0505	1120	406.168-010	Nursery
		406.884-010	Laborer
		406.887-030	Nursery
		406.887-022	Grounds
		406.887-026	Moss Ha
		406.887-010	Bagger
Auto Parts Clerk 04.0300	1122	289.358-046	Sales P
		289.358-060	Parts C
		289.358-064	Parts C
		289.358-068	Counter parts

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
	720.281-022	TV Svs & Repairman App.
	720.281-010	Radio Repairman
1120	406.168-010	Nurseryman
	406.884-010	Laborer, nursery
	406.887-030	Nursery Worker
	406.887-022	Groundsman
	406.887-026	Moss Handler
	406.887-010	Bagger & Burlap Man
1122	289.358-046	Sales Person, parts
	289.358-060	Parts Clerk
	289.358-064	Parts Counterman
	289.358-068	Counterman, automotive parts

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
		D.O.T. Number	D.O.T. Job
Alabama (cont.)			
LPN 07.0302	1123	079.378-026	LPN
		354.878-018	Midwife
		354.878-022	Practical
Alterationist 09.0202	1124	785.281-010	Alteratio
		785.381-026	Seamstres
		785.381-010	Men's Gar
		785.381-038	Women's G
Cosmetology 17.2602	1125	332.271-010	Cosmetolo
		331.878-010	Manicuri
		332.271-038	Managing
		332.271-014	Cosmetol
		332.381-010	Wig Dres
Masonry 17.1004	1126	861.381-010	Bricklay
		861.381-014	Bricklay

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1123	079.378-026	LPN
	354.878-018	Midwife
	354.878-022	Practical Nurse
1124	785.281-010	Alteration Tailor
	785.381-026	Seamstress, alteration
	785.381-010	Men's Garment Fitter
	785.381-038	Women's Garment Fitter
1125	332.271-010	Cosmetologist
	331.878-010	Manicurist
	332.271-038	Managing Cosmetologist
	332.271-014	Cosmetologist, apprentice
	332.381-010	Wig Dresser
1126	861.381-010	Bricklayer, construction
	861.381-014	Bricklayer, brick & tile

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
		D.O.T. Number	D.O.T. J
Alabama (cont.)			
		861.381-022	Bricklay
		859.884-010	Bricklay
FLORIDA			
Sod Production 01.0506	1220	407.999-010	Sod Prod
Auto Body	1221	807.381-010	Auto Bod
		807.287-010	Shop Est
		845.781-018	Auto Pai
Golf Course 01.0506	1222	407.883-010	Greenske
		407.137-010	Greenske
		407.138-010	Superint
Auto Mechanic 17.0302	1223	620.281-014	Mechanic
		620.281-018	Auto Tes
		620.381-014	Auto Svs
		620.884-010	Auto Mec

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
	861.381-022	Bricklayer, fire brick
	859.884-010	Bricklayer, paving
1220	407.999-010	Sod Production Worker
1221	807.381-010	Auto Body Repairman
	807.287-010	Shop Estimator
	845.781-018	Auto Painter
1222	407.883-010	Greenskeeper II
	407.137-010	Greenskeeper I
	407.138-010	Superintendent, greens
1223	620.281-014	Mechanic, auto
	620.281-018	Auto Tester
	620.381-014	Auto Svs. Mechanic
	620.884-010	Auto Mechanic Helper

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
		D.O.T. Number	D.O.T. Job
Florida (cont.)			
Combination Welding 17.260306	1236	812.884-014	Welder, co
		812.884-010	Welder, co apprenti
		812.884-022	Welder, re
		812.884-018	Welder, pr
Floriculture 01.0502	1237	406.181-010	Flower Gro
		406.181-028	Flower Gro
		406.181-034	Flower Gro
Hospital Ward Clerk 14.0499	1238	219.388-286	Ward Clerk
		249.388-034	Medical Re
		237.368-018	Hospital A
		237.368-030	Out-Patien
County Tax Collector 14.9901	1239	188.168-066	Tax Collec
		188.168-072	Deputy/Ass Collecto
		188.168-014	Tax Collec

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1236	812.884-014	Welder, combination
	812.884-010	Welder, combination, apprentice
	812.884-022	Welder, repair
	812.884-018	Welder, production line
1237	406.181-010	Flower Grower
	406.181-028	Flower Grower, field
	406.181-034	Flower Grower, greenhouse
1238	219.388-286	Ward Clerk, hospital
	249.388-034	Medical Records Clerk
	237.368-018	Hospital Admitting Clerk
	237.368-030	Out-Patient Admitting Clerk
1239	188.168-066	Tax Collector, county
	188.168-072	Deputy/Assistant Tax Collector
	188.168-014	Tax Collection Specialist

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
		D.O.T. Number	D.O.T. J
Florida (cont.)			
Housing Manager 04.1700	1299	188.168-028	Housing
		189.168-044	Housing
		184.168-112	Housing Superv
		195.108-066	Social S
		188.168-036	Housing
		186.168-026	Manager,
GEORGIA			
Data Processing 14.0201	1331	213.382-018	Digital
		213.138-010	Supervis Operat
Machinist 17.2302	1332	609.885-022	Machinis
		600.280-030	Machinis
		600.280-034	Machinis
		600.380-026	Machine
		600.381-010	Layout M

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1299	188.168-028	Housing Manager
	189.168-044	Housing Management Aide
	184.168-112	Housing Maintenance Supervisor
	195.108-066	Social Service Supervisor
	188.168-036	Housing Occupancy Clerk
	186.168-026	Manager, Housing Project
1331	213.382-018	Digital Computer Operator
	213.138-010	Supervisor, Computer Operator
1332	609.885-022	Machinist
	600.280-030	Machinist I
	600.280-034	Machinist, Apprentice
	600.380-026	Machine Setup Operator
	600.381-010	Layout Man

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'	
		D.O.T. Number	D.O.T.
Georgia (continued)			
Programmer 14.0203	1343	020.188-026	Program
		020.168-005	Chief B
Emergency Medical 07.0907	1344	354.878-010	First A
		355.878-010	Ambulan
		355.878-026	Emergen Atten
KENTUCKY			
Dental Assistant 07.0101	1441	079.378-010	Dental
Tractor Mechanic 01.0301	1442	620.281-094	Tractor
		620.884-050	Tractor
		624.281-010	Farm Eq
		624.381-010	Farm Eq
		624.281-014	Farm Eq
		624.781-018	Impleme Repai
		624.884-010	Greaser

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1343	020.188-026	Programmer, business
	020.168-005	Chief Business Programmer
1344	354.878-010	First Aid Attendant
	355.878-010	Ambulance Attendant
	355.878-026	Emergency Entrance Attendant
1441	079.378-010	Dental Assistant
1442	620.281-094	Tractor Mechanic
	620.884-050	Tractor Mechanic Helper
	624.281-010	Farm Equipment Mech. I
	624.381-010	Farm Equipment Mech. II
	624.281-014	Farm Equipment Mech. Helper
	624.781-018	Implement Assembly Repairman
	624.884-010	Greaser

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'	
		D.O.T. Number	D.O.T.
Kentucky (cont.)			
Cashier-Checker 04.0600	1443	299.468-010	Cashier
		920.887-022	Bagger
Construction Carpenter 17.1001	1444	860.381-026	Carpent
		860.781-014	Carpent
		860.381-030	Carpent
Bank Teller 14.0105	1445	212.368-010	Teller
		212.138-010	Head Te
		212.368-014	Collect Telle
		212.368-018	Note Te
Child Care 09.0201	1446	359.878-018	Child
		359.878-026	Child
Industrial Electrician 17.1002	1453	824.281-014	Electri

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1443	299.468-010	Cashier-Checker
	920.887-022	Bagger
1444	860.381-026	Carpenter, construction
	860.781-014	Carpenter, rough
	860.381-030	Carpenter, apprentice
1445	212.368-010	Teller
	212.138-010	Head Teller
	212.368-014	Collection & Exchange Teller
	212.368-018	Note Teller
1446	359.878-018	Child Care Attendant
	359.878-026	Child Care Assistant
1453	824.281-014	Electrician, industrial

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'	
		D.O.T. Number	D.O.T.
Kentucky (cont.)			
		829.887-014	Electri helpe
		829.281-022	Electri repai
Legal Secretary 14.0702	1454	201.368-010	Legal S
		202.388-010	Court R
Medical Assistant 07.0904	1455	079.368-022	Medical
		079.368-034	Medical
		079.368-046	Medical
Drapery Worker 09.0204	1456	299.488-010	Drapery
		299.381-014	Drapery
		299.884-010	Drapery
		785.381-250	Drapery
		787.782-086	Drapery

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
	829.887-014	Electrician, industrial helper
	829.281-022	Electrician, industrial repairman
1454	201.368-010	Legal Secretary
	202.388-010	Court Reporter
1455	079.368-022	Medical Assistant-general
	079.368-034	Medical Assistant-adm.
	079.368-046	Medical Assistant-clinical
1456	299.488-010	Drapery Estimator
	299.381-014	Drapery Measureman
	299.884-010	Drapery Hanger
	785.381-250	Drapery Seamstress
	787.782-086	Drapery Worker

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'	
		D.O.T. Number	D.O.T.
Kentucky (cont.)			
Agriculture Parts Clerk 01.0305	1458	185.168-090	Agricul Parts
		185.168-092	Agricul Parts
LOUISIANA			
Ship Operations 17.0802	2095	197.168-010	Master
		197.133-034	Tug Bo
		911.884-010	Able S
		197.130-014	Marine
		315.381-022	Cook,
		911.887-034	Ordina
		911.887-022	Deckha
Hotel/Motel Management 04.1100	2096	187.118-030	Manage
		187.118-034	Manage
		187.168-094	Manage

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1458	185.168-090	Agriculture Equipment Parts Man
	185.168-092	Agriculture Equipment Parts Clerk
2095	197.168-010	Master, Ship
	197.133-034	Tug Boat and Ship Mate
	911.884-010	Able Seaman
	197.130-014	Marine Engineer
	315.381-022	Cook, ship
	911.887-034	Ordinary Seaman
	911.887-022	Deckhand
2096	187.118-030	Manager, hotel
	187.118-034	Manager, motel
	187.168-094	Manager, front office

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.	
		D.O.T. Number	D.O.T.
Louisiana (cont.)			
		211.468-034	Desk Cl
		324.138-014	Bell Ca
		242.368-010	Hotel C
		324.878-010	Porter
		324.878-014	Bellman
		324.878-018	Doorman
		324.878-022	Room Se
MISSISSIPPI			
Plumbing 17.1007	1551	862.381-074	Plumbe
		862.381-082	Plumbe
		862.381-088	Plumbe
		862.884-014	Plumbe
		862.131-010	Plumbe
Landscaping 01.0504	1552	407.884-010	Ground
		407.181-010	Landsc

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
	211.468-034	Desk Clerk
	324.138-014	Bell Captain
	242.368-010	Hotel Clerk
	324.878-010	Porter
	324.878-014	Bellman
	324.878-018	Doorman
	324.878-022	Room Service Clerk
1551	862.381-074	Plumber, construction
	862.381-082	Plumber, maintenance
	862.381-088	Plumber Apprentice
	862.884-014	Plumber Helper
	862.131-010	Plumber Foreman
1552	407.884-010	Groundskeeper
	407.181-010	Landscape Gardener

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'	
		D.O.T. Number	D.O.T.
Mississippi (cont.)			
Cotton Gin 01.0402	1563	461.885-014	Ginner
		461.137-010	Yard F
		920.885-014	Cotton
		229.488-018	Gin Cl
Industrial Sewing 17.3399	1564	789.132-010	Forema
		786.782-090	Sewing Regu
		786.885-034	Sewing Spec
		787.782-290	Sewin All
SOUTH CAROLINA			
Textile Production 17.3399	2132	683.130-014	Loom
		683.280-018	Loom
		683.380-014	Loom
		684.280-010	Loope
		681.280-014	Machi

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
1563	461.885-014	Ginner
	461.137-010	Yard Foreman
	920.885-014	Cotton Bailer
	229.488-018	Gin Clerk
1564	789.132-010	Foreman, sewing room
	786.782-090	Sewing Machine Operator - Regular
	786.885-034	Sewing Machine Operator - Special Equipment
	787.782-290	Sewing Machine Operator - All Around
2132	683.130-014	Loom Fixter Overseer
	683.280-018	Loom Fixer
	683.380-014	Loom Changer
	684.280-010	Looper Fixer
	681.280-014	Machine Repairman

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.	
		D.O.T. Number	D.O.T.
Small Engine Repair 17.3100	2133	625.281-034	Engine
		625.281-042	Power
		625.281-032	Lawnmo
		623.281-038	Outboa
TEXAS			
Water Operator 17.3203	1661	954.782-014	Water Opera
		955.782-018	Sewage
		955.885-014	Water/
		955.887-028	Sewage
		029.181-044	Water/ Labo
Police Science 17.2802	1662	375.268-030	Patrol
		375.168-054	Police
		375.268-046	Highwa
		377.868-014	Sherif
		375.168-046	Police

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
2133	625.281-034	Engine Repairman
	625.281-042	Power Saw Mechanic
	625.281-032	Lawnmower Engine Repairman
	623.281-038	Outboard Motor Mechanic
1661	954.782-014	Water Treatment Plant Operator
	955.782-018	Sewage Plant Operator
	955.885-014	Water/Waste Water Operator
	955.887-028	Sewage Disposal Worker
	029.181-044	Water/Wastewater Laboratory Tester
1662	375.268-030	Patrolman
	375.168-054	Police Sargent
	375.268-046	Highway State Patrolman
	377.868-014	Sheriff, deputy
	375.168-046	Police Captain

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.	
		D.O.T. Number	D.O.T.
Texas (cont.)			
Offset Printing 17.1901	1675	141.081-046	Layout
		972.382-010	Lithog
		971.887-010	Plate
		972.781-010	Platem
		651.782-042	Offset
		651.782-046	Offset
		651.782-050	Offset
		651.885-014	Offset
		651.886-014	Press
Architectural Drafting 17.1300	1676	001.281-010	Draft
		017.281-038	Draft
		017.281-050	Draft
		017.281-054	Draft ven
		019.281-010	Draft

Analysis of D.O.T. Job Titles by Project (continued)

	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
		D.O.T. Number	D.O.T. Job Title
	1675	141.081-046	Layout & Pasteup Man
		972.382-010	Lithographer
		971.887-010	Plate Setter
		972.781-010	Platemaker
		651.782-042	Offset Pressmen
		651.782-046	Offset Pressman, apprentice
		651.782-050	Offset Proof Press Operator
		651.885-014	Offset Press Operator II
		651.886-014	Press Feeder, apprentice
ting	1676	001.281-010	Draftsman, architectural
		017.281-038	Draftsman, apprentice
		017.281-050	Draftsman, detail
		017.281-054	Draftsman, heating and ventilation
		019.281-010	Draftsman, landscape

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T.	
		D.O.T. Number	D.O.T.
Texas (cont.)		003.281-022	Estima
		005.281-014	Drafts
		005.281-018	Struct
Diesel Mechanic 17.1200	1677	625.281-010	Diesel
		625.281-064	Hydrau
		625.281-080	Transm
		625.281-074	Elec.
		625.281-066	Brake
		625.884-010	Diesel
		625.281-030	Fuel-I
		625.281-014	Diesel
VIRGINIA			
Secretarial 14.0702	1771	201.368-018	Secret
		202.388-014	Stenog
		203.588-018	Typist

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'S	
	D.O.T. Number	D.O.T. Job Title
	003.281-022	Estimator and Draftsman
	005.281-014	Draftsman, detailer
	005.281-018	Structural Draftsman
1677	625.281-010	Diesel Mechanic
	625.281-064	Hydraulic System, diesel
	625.281-080	Transmission System, diesel
	625.281-074	Elec. System, diesel
	625.281-066	Brake and Wheel Man
	625.884-010	Diesel Mechanic Helper
	625.281-030	Fuel-Injection Service Man
	625.281-014	Diesel Engine Tester
1771	201.368-018	Secretary
	202.388-014	Stenographer
	203.588-018	Typist

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.T	
		D.O.T. Number	D.O.T
Virginia (cont.)			
		208.588-026	Transc Oper
		209.388-022	Clerk-
		207.782-030	Automa Oper
Food Service 09.0203	1772	314.381-010	Short-
		313.438-014	Head C
		313.381-018	Cook
		317.887-010	Cook,
		317.884-018	Pantry
		315.381-010	Cook
Logging 01.0703	1788	940.884-042	Woods
		940.884-068	Woods
		183.168-030	Loggin
		183.168-044	Loggin

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
	208.588-026	Transcribing Machine Operator
	209.388-022	Clerk-Typist
	207.782-030	Automatic Typewriter Operator
1772	314.381-010	Short-order Cook
	313.438-014	Head Cook
	313.381-018	Cook
	317.887-010	Cook, helper
	317.884-018	Pantryman
	315.381-010	Cook
1788	940.884-042	Woods Laborer, manual
	940.884-068	Woods Laborer, mechanized
	183.168-030	Logging Contractor
	183.168-044	Logging Foreman

Analysis of D.O.T. Job Titles by Project (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED AND RELATED D.O.	
Virginia (cont.)		D.O.T. Number	D.O.
		162.158-058	Log
		162.158-078	Fiel
Nurse Aide 07.0303	1789	355.878-034	Nurs
		355.878-038	Orde
		355.878-040	Geri
		355.878-022	Cott

Analysis of D.O.T. Job Titles by Project (continued)

PROJECT NUMBER	INCLUDED AND RELATED D.O.T.'s	
	D.O.T. Number	D.O.T. Job Title
	162.158-058	Log Buyer
	162.158-078	Field Man
1789	355.878-034	Nurse Aide
	355.878-038	Orderly
	355.878-040	Geriatric Aide
	355.878-022	Cottage Parent